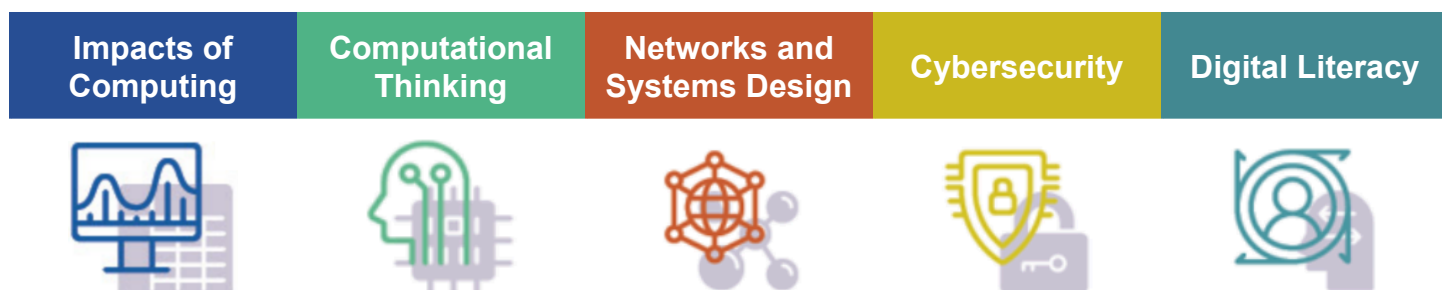# The New York State K-12 Computer Science and Digital Fluency Standards Grades K-1

Vision for the CS & DF Standards

Every student will know how to live productively and safely in a technology-dominated world. This includes understanding the essential features of digital technologies, why and how they work, and how to communicate and create using those technologies.

Computer Science and Digital Fluency Standards Concept Areas

Impacts of Computing	Computational Thinking	Networks and Systems Design	Cybersecurity	Digital Literacy

Links:

[NYS K-12 Computer Science and Digital Fluency Standards (All Grades)](#)

[NYS K-12 Computer Science and Digital Fluency Standards (Grades K-1)](#)

[Computer Science and Digital Fluency Standards Glossary of Terms](#)

Impacts of Computing

Computing affects many aspects of the world at local, national, and global levels. Individuals and communities influence computing through their behaviors and cultural and social interactions. In turn, computing influences new cultural practices. Informed citizens understand the ethical and social implications of the digital world, including equity and access to computing and computing technologies.

The Impacts of Computing Standards promote an understanding of the evolving impact of computing technologies on society through many lenses, including personal, social, cultural, accessibility, legal, economic, and ethical.

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Standard	K-1.IC.1 Identify and discuss how tasks are accomplished with and without computing technology.	
	Nouns	**Verbs**
	tasks *computing technology*	*identify* *discuss*
Clarifying Statement	Common tasks include sending a letter by email vs. post, taking a picture with a smartphone vs. camera, buying something with an app vs. with cash at a store.	
Focus Questions	*What kind of technology do you use to accomplish tasks at home?* *How do we use technology in our classroom? (attendance, morning meeting, etc.)* *How can technology make everyday tasks easier?* *What things can we do without using computers or phones?* *How do we do things differently when we use a computer or a phone?* *Can you think of something new we can do because we have computers or phones?* *Do you like using computers or doing things by hand better? Why?* *What games or activities do you enjoy on a computer or phone?* *How does using a computer or phone make some things easier for us?* *Can you draw a picture of something you do with a computer or phone?* *Do you know anyone who doesn't use a computer or phone? Why?* *How do you feel when you learn something new on a computer or phone?* *What do you want to learn to do on a computer or phone next?*	
Academic Language	*Tasks* *Smartphones* *Buttons* *Accomplished* *Robots* *Screens* *Computing technology* *Machines* *Games* *Computers* *Toys* *Tablets* *Tools*	
NYSED Examples	Example 1: Students could discuss the differences between playing a board game and a video game or mailing a letter and getting a text message. Example 2: Students could create a T chart of things they do that use technology and then compare that to how those tasks were accomplished before technology. Tasks might include looking things up online, map application, online games. Example 3: Have students take attendance on paper, then take attendance on the schools SMS system. Discuss the differences. Example 4: Students could compare and contrast a digital artifact from a different decade/century to one of their classrooms today.	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Interdisciplinary Connections	***Science*** • *Children will explore how computers help people and understand the differences between them and other objects like toys or tools.* • *Learn about activities like planting seeds or mixing colors that don't involve computers.* ***Social Studies*** • *Students will learn about how people did things before computers were invented and discuss different jobs and how computers help people in those jobs today.* ***Mathematics*** • *They will count the things they can do with or without computers and compare preferences.* • *Engaging in games where they mimic computer actions to count or sort items is also encouraged.* ***Language Arts*** • *Children will be encouraged to draw pictures or tell stories about how computers or phones assist them.* • *They will practice writing or verbalizing the names of activities done with computers.* ***Art*** • *Students will create visual representations of activities done with computers and those done without.* • *They will use various colors and shapes to illustrate differences.* ***Physical Education*** • *They will participate in games where they pretend to be computers or robots moving around.* • *Additionally, activities involving different body movements like dancing or stretching will be explored.* ***Music*** • *Students will listen to music and create their own rhythms and sounds using instruments like drums or shakers. Singing songs related to computers or activities involving them will also be included.* ***Health Education***

- *Children will discuss the fun of using computers but also the importance of physical activity and outdoor play.*
- *Balancing computer time with other activities will be emphasized.*

Engineering and Design

- *They will build structures with blocks or toys and brainstorm ways to improve or alter them using their imaginations.*
- *Simple puzzles or games requiring logical thinking similar to computers will also be explored.*

Environmental Science

- *Students will learn to care for their toys and computers to ensure their longevity.*
- *Discussions on recycling and ways to contribute to a clean and healthy planet will be encouraged.*

Additional Examples and Resources	*Students could challenge themselves to spend the day at school (or home) without computing technology* *Students could write about living a day without computing technology* *Students could sort images of tasks performed with or without technology (cell phone vs. rotary dial, letter vs. email, encyclopedia vs. wikipedia)* *Students compare walking to school to parent pick up and bus riding* *https://bestlifeonline.com/life-before-technology/* *Books: Look for age-appropriate books that introduce concepts of technology and its role in everyday tasks. Some titles include "Hello Ruby: Adventures in Coding" by Linda Liukas, "If I Built a Car" by Chris Van Dusen, and "Technology: Cool Women Who Code" by Andi Diehn.* *Educational Videos: Platforms like YouTube offer a variety of educational videos designed for young learners. Look for channels like Sesame Street, National Geographic Kids, or TED-Ed for videos explaining technology concepts in engaging ways.* *Interactive Websites: Websites like PBS Kids, ABCmouse, and Funbrain offer interactive games and activities that introduce basic technology concepts and their applications in everyday life.* *STEM Toys: Explore STEM (Science, Technology, Engineering, and Mathematics) toys and kits designed for young children. Brands like LEGO, K'NEX, and Snap Circuits offer sets that allow kids to build and explore technology concepts in a hands-on way.* *Coding Apps: Introduce basic coding concepts through fun and interactive*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

apps designed for young children. Apps like ScratchJr, Kodable, and Tynker offer kid-friendly interfaces for learning programming basics.

Field Trips*: Arrange field trips to local places where children can see technology in action, such as a visit to a library to see computers, a fire station to see how technology is used in emergencies, or a farm to learn about modern agricultural technology.*

Guest Speakers*: Invite guest speakers such as parents, family members, or community members who work in technology-related fields to share their experiences and demonstrate how technology is used in their work.*

Hands-On Activities*: Plan hands-on activities where children can explore technology concepts firsthand. For example, set up a simple circuit activity using batteries, wires, and LED lights to demonstrate basic electrical concepts.*

Classroom Discussions*: Foster classroom discussions where children can share their experiences with technology and discuss how it helps them accomplish tasks in their daily lives. Encourage critical thinking by asking open-ended questions about the advantages and disadvantages of using technology.*

Project-Based Learning*: Implement project-based learning activities where children work in groups to solve real-world problems using technology. For example, challenge students to design and create a simple device or application to solve a specific problem in their school or community.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Standard	**K-1.IC.2** Identify and explain classroom and home rules related to computing technologies and digital information.	
	Nouns	**Verbs**
	classroom *home* *computing technologies* *digital information* *rules*	*identify* *explain*
Clarifying Statement	Rules could include when it's okay to use a device, what programs or apps are okay to use, how to treat the equipment, etc.	
Focus Questions	*What are some rules we follow when using computers or tablets in the classroom?* *Why is it important to ask for help from a teacher or adult when using technology?* *What are some ways we can keep our digital information safe when using computers or phones at home?* *How do we take care of the devices we use in the classroom and at home?* *Can you name some examples of things we should not do when using technology, both in the classroom and at home?* *Why is it important to use technology for learning purposes rather than just playing games?* *How do we treat other people's digital information with respect and privacy?* *What should we do if we accidentally click on something we shouldn't while using a computer or tablet?* *How can we be responsible digital citizens when using technology in the classroom and at home?* *Can you think of a time when following the rules for using technology kept you safe or helped you learn something new?*	
Academic Language	*Classroom rules* *Smartphones* *Asking permission* *Home rules* *TV* *Screen time* *Computing technologies* *Internet* *Online safety* *Computers* *Games* *Tablets* *Sharing*	
NYSED Examples	Example 1: Identify school rules to use computing technologies (e.g., don't share your password).	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	Example 2: Explore rules on time limits teachers place on technology use in the classroom and why those limits are important. Example 3: After discussing rules related to digital citizenship, students could play a game of telephone. Discuss how students can't stop one person from telling others and how it can change from person to person.
Interdisciplinary Connections	***Social Studies*** • *Explore how rules are created and why they are important in various settings, including the classroom and home. Discuss concepts of citizenship and responsibility in following rules to create a safe and respectful environment.* ***Language Arts*** • *Introduce storytelling or role-playing activities where students act out scenarios related to technology rules.* • *Encourage students to express their understanding through writing or drawing about their own experiences with following rules at school and home.* ***Mathematics*** • *Incorporate counting and sorting activities related to technology rules. For example, count the number of rules in the classroom or sort pictures of technology-related actions into "following rules" and "not following rules" categories.* ***Science*** • *Explore concepts of cause and effect by discussing the reasons behind technology rules and the consequences of not following them.* • *Engage in simple experiments or demonstrations to illustrate concepts such as privacy and data security.* ***Art*** • *Encourage students to create visual representations of technology rules using art materials.* • *They can design posters or illustrations depicting rules for using computers, tablets, or smartphones safely and responsibly.* ***Music*** • *Integrate music and movement by creating songs or chants about technology rules.*

- *Students can sing or dance along to catchy tunes that reinforce concepts such as online safety and respectful communication.*

Physical Education

- *Incorporate games and physical activities that reinforce technology rules. For example, play games where students must follow specific instructions related to technology use or engage in activities that promote teamwork and cooperation.*

Health Education

- *Discuss the importance of balance and moderation in technology use as part of overall well-being.*
- *Explore topics such as screen time limits, ergonomic practices, and the importance of taking breaks from digital devices.*

Technology

- *Provide opportunities for hands-on exploration of age-appropriate technology tools and resources.*

- *Students can practice following rules related to device usage, internet safety, and digital citizenship in a supervised and supportive environment.*

Family and Consumer Sciences

- *Extend learning about technology rules to the home environment by involving families in discussions and activities.*
- *Encourage students to share their knowledge and experiences with technology rules with their families and discuss ways to create a safe and positive digital environment at home.*

Additional Examples and Resources	*Consider why we have this standard or rules to begin with.* *Technology use read alouds…* *https://www.thetechieteacher.net/2016/11/top-10-list-of-technology-themed-read.html* ***Children's Books***: • *"The ABC's of Internet Safety" by Rebecca Conner* • *"Dot." by Randi Zuckerberg* ***Educational Videos***: • *Common Sense Education's "Digital Citizenship Videos for Kids" series*

- *BrainPOP Jr.'s "Internet Safety" videos*
- *Sesame Street's "Online Safety" segments*

Interactive Websites:

- *Common Sense Education's Digital Passport (interactive games and activities)*
- *PBS Kids' Webonauts Academy (digital citizenship games)*
- *National Geographic Kids' "Internet Safety" section (articles and quizzes)*

Printable Worksheets:

- *Common Sense Education's Digital Citizenship Classroom Poster Set*
- *Scholastic's "Internet Safety" printable worksheets*
- *Teachers Pay Teachers' digital citizenship resources (various worksheets and activities)*

Online Safety Games:

- *[Interland by Google](...) (online safety adventure game)*
- *[Privacy Pirates by MediaSmarts](...) (interactive game about online privacy)*

Parent Resources:

- *Common Sense Media's Family Toolbox (guides and resources for parents on digital citizenship)*
- *ConnectSafely's Parent Guides (resources on various online safety topics)*
- *Family Online Safety Institute's (FOSI) Parent Resources (tips and guides for promoting online safety at home)*

Guest Speakers:

- *Invite local law enforcement officers to discuss internet safety and cyberbullying prevention.*
- *Invite parents or community members who work in technology fields to share their expertise on online safety and digital citizenship.*

Educational Apps:

- *Digital Passport by Common Sense Education (interactive game for teaching digital citizenship)*
- *CyberPigs by MediaSmarts (story-based app for teaching online safety)*
- *Be Internet Awesome by Google (app featuring games and activities on digital citizenship)*

Digital Citizenship Curriculum:

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

- *Common Sense Education's Digital Citizenship Curriculum (free lessons and resources for teaching digital citizenship)*
- *Nearpod's Digital Citizenship Curriculum (interactive lessons for teaching online safety and responsible technology use)*
- *ISTE's Digital Citizenship in Action Curriculum (lessons and activities for teaching digital citizenship skills)*

Teacher Training Materials:

- *Professional development webinars and courses on digital citizenship and online safety, such as those offered by Common Sense Education, ISTE, and Edutopia.*
- *Online resources and lesson plans from educational organizations and government agencies focused on digital citizenship and internet safety education.*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Impacts of Computing: Ethics

Standard	**K-1.IC.3** Identify computing technologies in the classroom, home and community.	
	Nouns	**Verbs**
	computing technologies *classroom* *home* *community*	*identify*
Clarifying Statement	The focus should be on recognizing familiar computing technologies that we use in our lives.	
Focus Questions	*What kinds of technology do we use in our classroom? Can you name some examples?* *What technology do you use at home? How is it similar to or different from the technology we use at school?* *Can you identify any computing technologies in our community, such as at the library or grocery store?* *How do computers, tablets, or smartphones help us learn in the classroom?* *What do you use technology for at home? Is it for playing games, watching videos, or something else?* *Have you seen any technology being used in our neighborhood or community? What was it being used for?* *What are some ways technology helps people in our community, such as doctors, firefighters, or police officers?* *How do you interact with technology in your daily life, both at school and at home?* *Can you think of any other places in our community where people might use computers or technology?* *How does technology make certain tasks easier or more efficient in our classroom, home, or community?*	
Academic Language	*Computing technologies* *Computers* *Tablets* *Smartphones* *Smartboards* *Interactive whiteboards* *Robots* *Remote controls* *Digital cameras* *Television* *Video games* *Voice assistants (e.g., Alexa, Siri)* *Traffic lights* *Automatic doors*	
NYSED Examples	Example 1: A teacher might keep a class log of all the different computing technologies that they use, see, or read about throughout one school day. Example 2: Students could track all of the ways they see technology throughout the weekend to see technology outside of the classroom, such as an electronic toothbrush that tells them how long to brush.	

Impacts of Computing **Computational Thinking** **Networks and Systems Design** **Cybersecurity** **Digital Literacy**

	Example 3: Print pictures of different computer devices that students experience every day. Include pictures of things that might have computer components, but students might not realize are computers (e.g., cash register)
Interdisciplinary Connections	***Social Studies*** - *Explore how technology has changed over time and its impact on communities.* - *Discuss how different types of technology are used in various professions and industries, and how they contribute to the functioning of communities.* ***Language Arts*** - *Engage in storytelling activities where students create narratives about the role of technology in different settings, such as the classroom, home, or community.* - *Encourage students to use descriptive language to describe the features and functions of different computing technologies.* ***Mathematics*** - *Incorporate counting and sorting activities using pictures or symbols of computing technologies.* - *Students can count the number of computers, tablets, or smartphones in the classroom, home, or community and sort them based on different criteria, such as size, color, or function.* ***Science*** - *Explore the basic principles of how computing technologies work, such as input, processing, output, and storage.* - *Conduct simple experiments or demonstrations to help students understand concepts like touchscreens, binary code, or data storage.* ***Art*** - *Encourage students to create visual representations of computing technologies using art materials.* - *They can draw, paint, or sculpt models of computers, tablets, or smartphones, and decorate them with symbols or icons representing different functions or features.* ***Music*** - *Integrate music and movement by creating songs or chants about computing technologies.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Students can sing or dance along to catchy tunes that reinforce concepts like the names and uses of different devices.*

Physical Education

- *Incorporate movement activities that simulate using computing technologies, such as pretending to type on a keyboard or swipe on a touchscreen.*
- *This helps reinforce kinesthetic learning and encourages active engagement with the concepts.*

Health Education

- *Discuss the importance of using technology in moderation and maintaining a balance between screen time and physical activity.*
- *Teach students about healthy habits for using computing technologies, such as taking breaks, practicing good posture, and protecting their eyesight.*

Family and Consumer Sciences

- *Extend learning about computing technologies to the home environment by involving families in discussions and activities.*
- *Encourage students to share their knowledge and experiences with technology use at home and discuss ways to use technology responsibly and safely.*

Engineering and Design

- *Introduce basic concepts of design thinking and problem-solving by challenging students to design and build their own simple computing devices or models using craft materials.*
- *Encourage creativity and innovation in exploring how technology can be used to solve real-world problems in the classroom, home, or community.*

Additional Examples and Resources	*taking attendance, smart tv connecting videos to what we're learning, kids seeing the technology doing those things* *Device field trip or gallery walk*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Standard	K-1.IC.4 Identify public and private spaces in our daily lives.	
	Nouns	**Verbs**
	public *private* *spaces*	*identify*
Clarifying Statement	The focus is on recognizing the difference between a public shared space versus a private space.	
Focus Questions	*What places do we visit in our community that are public spaces?* *How do we behave differently in public spaces compared to private spaces?* *Why is it important to respect the boundaries of private spaces?* *Can you name some examples of public spaces? What about private spaces?* *How do we know if a space is public or private?* *What are some rules or expectations we follow when we're in public spaces?* *How can we ask for permission before entering someone's private space?* *How do we keep our own private spaces safe and secure?* *What are some ways we can show respect for public spaces?* *How do public and private spaces help us in our daily lives?*	
Academic Language	*Public spaces* *Library* *Backyard* *Private spaces* *Store* *Community center* *Classroom* *Home* *Neighborhood* *School playground* *Bedroom* *Street* *Park* *Bathroom*	
NYSED Examples	Example 1: A teacher can present a list of spaces (e.g., the classroom, the teacher's house, the library) and have students identify which spaces they can access and which they cannot. Then the class can talk about the differences between these spaces. Example 2: The class can create a chart with public and private places and talk about the differences, like a public park versus your back yard or a living room versus a bathroom.	
Interdisciplinary Connections	***Social Studies/Community Studies*** *Exploring the concept of public spaces versus private spaces within the community.*	

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

	• *This can include discussing places like parks, libraries, and schools as public spaces, while homes and bedrooms are private spaces.* ***Language Arts*** • *Reading books or stories that discuss public and private spaces, and engaging in discussions or activities related to understanding the differences between them.* ***Art*** • *Creating visual representations or drawings of public and private spaces, allowing students to express their understanding through artistic means.* ***Dramatic Play*** • *Setting up a pretend play area where students can role-play scenarios involving public and private spaces, encouraging them to understand the importance of respecting boundaries.* ***Mathematics*** • *Introducing concepts of spatial awareness by discussing the sizes and locations of public and private spaces, and engaging in activities that involve comparing and contrasting them.* ***Health Education*** • *Teaching about personal boundaries and safety, emphasizing the importance of recognizing and respecting public and private spaces to stay safe and healthy.* ***Technology*** • *Introducing basic concepts of digital privacy and safety, discussing how certain online spaces can be public while others are private, and teaching students to navigate digital platforms responsibly.*
Additional Examples and Resources	*-Have a number of examples/scenarios that are public and private (both in real life and online) have the class vote with their feet and talk about why the example is private or public.* *What do we do when we end up in a place we didn't start (website)* *Public vs. Private sorting*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Impacts of Computing: Ethics

Standard	K-1.IC.5 *Standard begins in grade band 2-3*	
	Nouns	**Verbs**
Clarifying Statement		
Focus Questions		
Academic Language		
NYSED Examples		
Additional Examples and Resources		
Interdisciplinary Connections		

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Impacts of Computing: Accessibility

Standard	K-1.IC.6 With teacher support, identify different ways people interact with computers and computing devices.	
	Nouns	**Verbs**
	teachers *people* *computers* *computing devices*	*identify* *interact*
Clarifying Statement	The focus is on the features of computers and other devices, and the things that make them easier to use (i.e. drop-down menus, buttons, areas to type).	
Focus Questions	*What are some examples of computing devices that people use?* *How do we turn on a computer or computing device?* *What are some ways we can control a computer or device, such as using a mouse or touchpad?* *Can you name some things we can do on a computer, like typing on a keyboard or clicking on buttons?* *How do we communicate with a computer, such as giving it commands or asking it questions?* *What are some ways we can see or hear information on a computer, like looking at a screen or listening to speakers?* *How do we know when a computer is turned on or off?* *What are some different types of software or programs that we can use on a computer?* *How do we keep a computer or device safe and secure?* *Can you think of other ways that people interact with computers and computing devices?*	
Academic Language	*Interact* *Computers* *Computing devices* *Typing* *Touching screens* *Clicking buttons* *Using a mouse* *Speaking to voice assistants* *Watching videos* *Playing games* *Listening to music* *Drawing with digital pens* *Learning with educational apps*	
NYSED Examples	Example 1: Students could use both a mouse and a touch screen to operate a computer. Example 2: Voice recognition software and other assistive devices and capabilities can be explored.	
Interdisciplinary Connections	**Language Arts**	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Reading books or stories about technology and computers, and discussing how characters interact with devices in the stories.
- Students can also practice writing or dictating sentences about their experiences with computers.

Art

- Creating visual representations of different types of computing devices and their features.
- This could include drawing pictures of computers, tablets, and smartphones, as well as labeling their different parts such as screens, keyboards, and buttons.

Mathematics

- Engaging in activities that involve counting and sorting different types of computing devices, such as counting the number of buttons on a keyboard or sorting devices by size or shape.

Science

- Exploring the basic principles of how computers and computing devices work, including concepts such as input and output.
- Students can also engage in simple experiments to learn about cause and effect, such as pressing different buttons on a device and observing what happens.

Social Studies

- Discussing the role of technology in society and how it has changed over time.
- Students can learn about the ways that computers and computing devices are used in different professions and communities.

Health Education

- Teaching students about safe and responsible use of technology, including concepts such as screen time limits and proper posture when using devices.
- Students can also learn about the importance of taking breaks and staying physically active, even when using technology.

Technology

- Introducing students to basic digital literacy skills, such as using a mouse or touchpad to navigate a computer screen, clicking on buttons and links, and typing on a keyboard.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	● Students can also learn about different types of software and applications, and how they are used for different purposes.
Additional Examples and Resources	*explore kid friendly website that includes many types of interactions*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Impacts of Computing: Career Paths

Standard	K-1.IC.7 Identify multiple jobs that use computing technologies.	
	Nouns	**Verbs**
	jobs *computing technologies*	*identify*
Clarifying Statement	The focus is on identifying jobs that utilize computing technology and how technology impacts a range of industries. Doctors, business owners, police officers, auto repair technicians, farmers, architects, and pilots use computing technology in their jobs.	
Focus Questions	*What are some different jobs or professions that use computers and technology?* *How do doctors use computers and technology in their jobs?* *What are some ways that business owners use computers to help run their businesses?* *How do police officers use technology to help keep communities safe?* *What role does technology play in auto repair technicians' work?* *How do farmers use computers and technology to help with farming tasks?* *What are some ways that architects use computers in their work?* *How do pilots use technology to navigate and operate aircraft?* *Can you think of other jobs or professions that use computers and technology?* *How has technology changed the way people work in different industries?* *What computer technology do you see adults using when they do their job?*	
Academic Language	*Jobs* *Computing technologies* *Teacher* *Doctor* *Nurse* *Police officer* *Firefighter* *Chef* *Librarian* *Scientist* *Astronaut* *Farmer* *Pilot* *Artist* *Programmer*	
NYSED Examples	Example 1: Students can take turns identifying jobs that use devices (e.g., cashier, engineer, teacher, IT support, etc.).	
Interdisciplinary Connections	**Social Studies** Explore different careers and professions that use computing technology, discussing how technology has changed the way people work in various industries.	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Students can learn about the roles and responsibilities of different professionals and how technology impacts their daily tasks.

Language Arts

- Read books or stories about different careers and professions that use computing technology, and discuss the vocabulary and concepts related to each job.
- Students can also practice writing or dictating sentences about how technology is used in various industries.

Mathematics

- Engage in activities that involve counting and sorting different types of technology devices, such as counting the number of computers in a classroom or sorting devices by size or shape.
- Students can also learn about basic concepts of data analysis and how technology is used to collect and analyze information in different fields.

Science

- Explore the role of technology in scientific research and discovery, discussing how computers are used to collect, analyze, and visualize data in fields such as biology, chemistry, and astronomy.
- Students can also learn about how technology is used in engineering and design processes.

Health Education

- Discuss the role of technology in healthcare professions, including how doctors and nurses use computers and medical devices to diagnose and treat patients.
- Students can also learn about the importance of privacy and security when using technology in healthcare settings.

Art

- Explore the ways that technology is used in creative industries such as graphic design, animation, and video production.
- Students can learn about how computers are used to create digital art and multimedia projects, and they can engage in hands-on activities to create their own digital artwork.

Technology

- Introduce students to basic concepts of computer science and programming, discussing how technology works and how it is used to solve problems in different fields.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	● Students can also learn about the importance of digital literacy and responsible use of technology in today's society.
Additional Examples and Resources	https://code.org/careers-with-cs/k5 -pretend play with specific jobs to perform (computer help desk, graphic design, data collection) I might want to be job fair with parents and family presenters or dream board Based on what I want to be when I grow up

Computational Thinking

Computational thinking involves thinking about and solving problems in ways that can be carried out by a computer. Computational thinking not only underpins all theory and application of computer science, but also influences many other subject areas. Computational thinking includes both core concepts, such as algorithms and variables, and core practices, such as abstraction, decomposition, data analysis, modeling, and simulation, that are vital not only to the design and development of computer programs but also to the strategic use of computational power to solve problems across disciplines. The process of creating meaningful and efficient solutions, often done in collaboration with others, typically involves these steps: defining the problem, breaking apart large problems into smaller ones, recombining existing solutions, analyzing different solutions, using data to inform new potential solutions, and looking at information in new ways to develop innovative solutions.

Computational thinking plays an important role in supporting the creation of solutions to problems, both large and small. Algorithms, programs, simulations, and data are essential to all computing systems, empowering people to communicate and collaborate with others around the world. The standards promote development of foundational skills, knowledge, and experience to solve problems by creating solutions that utilize computational thinking concepts and practices.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Computational Thinking: Modeling and Simulation

Standard	K-1.CT.1 Identify and describe one or more patterns (found in nature or designed) and examine the patterns to find similarities and make predictions.	
	Nouns	**Verbs**
	pattern *similarities*	*identifying* *describe* *examine* *predict*
Clarifying Statement	The emphasis is on identifying patterns and then making predictions based on the pattern.	
Focus Questions	*Where do we see patterns every day?* *What is the next step of the pattern?* *What is the overall long-term sequence?* *What is repeated in the pattern?* *What do you think will happen next?* *What is a pattern? Can you give an example of a pattern you've seen before?* *How do we identify patterns in things we observe in nature or designed?* *What are some similarities you notice when looking at different patterns?* *How can patterns help us make predictions about what might happen next?* *Can you describe a pattern you see in the sky, such as the phases of the moon?* *What patterns do you notice in the weather or seasons? How can we predict what the weather might be like tomorrow based on these patterns?* *How can we use patterns to organize and sort objects or information?* *Can you create your own pattern using objects or shapes? What predictions can you make about the next step in your pattern?* *How do patterns help us understand and interpret information in books or stories?* *Why is it important to notice and understand patterns in our daily lives?*	
Academic Language	*Patterns* *Sizes* *Repetition* *Nature* *Arrangements* *Symmetry* *Designed* *Similarities* *Sequences* *Shapes* *Predictions* *Colors* *Observations*	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Computational Thinking: Modeling and Simulation

NYSED Examples	Example 1: Students can study the patterns of snowflakes or butterflies to finish a missing pattern. (SCIENCE) Example 2: Studying plants and animals in science can identify a real-world pattern (e.g., butterfly wings) and extend it through their own drawings. (SCIENCE) Example 3: Students could study origami and discuss how the folding is a pattern and an algorithm. (ARTS)
Interdisciplinary Connections	**Mathematics** ● *Explore mathematical patterns such as shapes, numbers, and sequences.* ● *Identify and describe patterns in counting, sorting, and arranging objects.* ● *Make predictions about what comes next in a pattern sequence.* **Science** ● *Investigate patterns found in nature, such as the life cycles of plants and animals, weather patterns, and patterns in the sky (like the phases of the moon).* ● *Observe these patterns, describe them, and make predictions about future occurrences based on their observations.* **Art** ● *Create artwork inspired by patterns found in nature or designed. Students can explore different art techniques and materials to represent patterns visually.* ● *Experiment with repeating patterns and symmetry in their artwork.* **Language Arts** ● *Read books or stories that feature patterns as a theme.* ● *Identify patterns in the text, such as rhyming words or repeated phrases, and discuss how these patterns contribute to the overall story.* ● *Write or dictate their own stories incorporating patterns.* **Social Studies** ● *Explore cultural patterns and traditions from around the world.* ● *Learn about different cultures' customs, clothing, and celebrations, and identify patterns within these cultural practices.* ● *Make predictions about future events based on their understanding of these patterns.* **Music** ● *Listen to and create music that incorporates patterns such as rhythms, melodies, and harmonies.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	- *Clap or tap along to rhythmic patterns, sing songs with repetitive lyrics, and play simple musical instruments to explore patterns in music.* ***Technology*** - *Use digital tools to explore and create patterns.* - *Use educational apps and software to practice pattern recognition and prediction skills.* - *Create digital artwork or animations featuring patterns.* ***Physical Education*** - *Explore patterns in movement and physical activities.* - *Participate in rhythmic exercises, dance routines, and sports drills that involve repeating patterns of movement.* - *Make predictions about what comes next in a sequence of movements or actions.*
Additional Examples and Resources	*Calendar patterns* *Students can build patterns with various objects* *shapes* *base ten patterns* *Read Brown Bear, Brown Bear*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Computational Thinking: Data Analysis and Visualization

Standard	K-1.CT.2 Identify different kinds of data that can be collected from everyday life.	
	Nouns	**Verbs**
	data *everyday life*	*identify*
Clarifying Statement	The emphasis is on understanding what is data and identifying different types of data, while exploring how data can be collected and sorted.	
Focus Questions	● *What is data? How do we collect data?* ● *What are some examples of data we can collect from everyday life?* ● *How can we collect data about the weather?* ● *What data can we collect about our classmates or friends?* ● *How do we collect data about our favorite foods or activities?* ● *What kinds of data can we collect by measuring objects or distances?* ● *How can we collect data about the colors we see around us?* ● *What data can we collect by observing plants and animals?* ● *How can we collect data about the books we read or the movies we watch?* ● *Why is it important to collect and organize data in our daily lives?*	
Academic Language	*Data* *Numbers* *Plants* *Different kinds* *Shapes* *Weather* *Everyday life* *Colors* *Foods* *Collection* *Sizes* *Activities* *Information* *Animals* *Feelings*	
NYSED Examples	Example 1: Students can create and read data from charts and graphs made about their classroom interests. (MATH, SCIENCE) Example 2: Take a "field trip" to the cafeteria and have students see what happens when they buy lunch and how it counts in the system. Example 3: Students could chart/read data by using numbers, pictures, audio, video, and/or collections of objects.	
Interdisciplinary Connections	**Mathematics** ● Explore mathematical data such as numbers, shapes, and measurements. ● Collect data by counting objects, measuring lengths, and sorting shapes. ● Learn about basic concepts of data organization, such as sorting and categorizing. **Science**	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Investigate scientific data related to observations and experiments.
- Collect data by observing changes in the environment, recording temperatures, and measuring volumes.
- Learn about different types of scientific data, such as qualitative and quantitative data.

Social Studies

- Explore social data related to people and communities.
- Collect data by conducting surveys, interviewing classmates, and observing social interactions.
- Learn about different aspects of social data, such as demographics and cultural practices.

Language Arts

- Read books or stories that involve collecting and analyzing data.
- Learn about the importance of gathering information and making observations to understand the world around them.
- Practice writing or dictating sentences to describe their own experiences collecting data.

Art

- Create artwork inspired by different types of data.
- Use visual representations such as graphs, charts, and diagrams to organize and display data in creative ways.
- Explore patterns and trends in data through artistic expression.

Health Education

- Investigate health-related data such as food choices, exercise habits, and personal hygiene.
- Collect data by keeping journals of their daily activities and habits.They can also learn about the importance of gathering accurate data to make informed decisions about their health.

Technology

- Use digital tools to collect and analyze data.
- Use educational apps and software to record data, create graphs, and draw conclusions.
- Explore how technology is used to collect and analyze data in various fields such as science, business, and healthcare.

Physical Education

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

	• Explore physical activity-related data such as steps taken, heart rate, and sports performance. • Collect data by using pedometers, heart rate monitors, and performance trackers. • Learn about the importance of setting goals and tracking progress based on data collected.
Additional Examples and Resources	*lunch count, attendance, work completion boards*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Computational Thinking: Data Analysis and Visualization

Standard	**K-1.CT.3** Identify ways to visualize data, and collaboratively create a visualization of data.	
	Nouns	**Verbs**
	data	*identify* *create* *visualization*
Clarifying Statement	Ways to visualize data include tables, graphs, and charts.	
Focus Questions	• *What types of tables, graphs, and charts are available?* • *Which one will work best with your data?* • *How can we show this information as a picture or in a visual way?* • *What are different ways we can represent information visually, such as through pictures, numbers, tables, graphs, or charts?* • *How do we decide which type of visualization to use based on the data we want to represent?* • *Can you explain the purpose of using visualizations to represent data? Why might it be helpful?* • *How do tables help us organize and understand data? Can you think of examples of when we might use tables?* • *What are graphs and charts, and how do they help us understand data in different ways?* • *How can we work together as a team to create a visualization of our data? What roles can each of us play?* • *What materials or tools might we need to create our visualization? How can we use them safely and effectively?* • *How do we ensure that our visualization is clear and easy to understand for others who may look at it?* • *Can you think of real-life situations where visualizing data might be important or useful?* • *How can we use our visualization to share information with others or tell a story about our data?*	
Academic Language	*Visualize* *Graphs* *Numbers* *Data* *Charts* *Objects* *Collaboratively* *Pictures* *Patterns* *Create* *Colors* *Representations* *Visualization* *Shapes*	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Computational Thinking: Data Analysis and Visualization

NYSED Examples	Example 1: Have students poll the class on their favorite food, color, game etc., then compare bar charts, line and/or pie graphs to best show the information. (MATH) Example 2: Students could count and chart the number of pieces of each color of candy in a bag of candy, such as Skittles or M&Ms. (SCIENCE, MATH)
Interdisciplinary Connections	***Mathematics*** ● *Explore mathematical concepts such as counting, sorting, and comparing using data visualization tools.* ● *Learn about different types of graphs and charts, such as bar graphs, pictographs, and tally charts, and practice interpreting and creating them.* ***Science*** ● *Investigate scientific data and observations using data visualization techniques.* ● *Create charts and graphs to represent data collected during science experiments or observations of the natural world.* ● *Learn about the importance of visualizing data to identify patterns and trends.* ***Social Studies*** ● *Explore social data related to people and communities using data visualization methods.* ● *Create charts and graphs to represent data about their classmates' favorite foods, hobbies, or family traditions.* ● *Learn about how data visualization can help us understand social trends and demographics.* ***Language Arts*** ● *Use data visualization tools to analyze and interpret information from books, stories, and informational texts.* ● *Create visual representations of characters, settings, and events from stories they read, helping them to understand and remember key details.* ***Art*** ● *Explore artistic techniques for creating visually appealing data visualizations.* ● *Use colors, shapes, and patterns to represent data in creative and engaging ways.* ● *Experiment with different mediums such as drawing, painting, or collage to create their visualizations.* ***Technology***

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	- *Use digital tools and software to create digital data visualizations.* - *Learn to use spreadsheet programs to organize and analyze data, and graphing software to create charts and graphs.* - *Explore online tools and apps for creating interactive visualizations.* ***Health Education*** - *Investigate health-related data such as nutrition, exercise, and wellness using data visualization methods.* - *Create charts and graphs to represent data about their daily physical activity, sleep habits, or food choices.* - *Learn about how data visualization can help us make informed decisions about our health.* ***Physical Education*** - *Explore physical activity-related data using data visualization techniques.* - *Create charts and graphs to represent data about their sports performance, exercise routines, or fitness goals.* - *Learn about how data visualization can help us track progress and set goals for improvement.*
Additional Examples and Resources	*Students can create varying graphs with teacher support (teachers can use tech tools for data collection to display) [Here's the digital way we do it, here's the analog way]*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Computational Thinking: Abstraction and Decomposition

Standard	**K-1.CT.4** Identify a problem or task and discuss ways to break it into multiple smaller steps.	
	Nouns	**Verbs**
	problem *task* *break* *multiple* *steps*	*identify* *discuss*
Clarifying Statement	The focus is on identifying a complex (for the age group) task or problem to break apart into smaller steps. The focus should be on understanding why this process is helpful.	
Focus Questions	*What is the first step…next…last step?* *What does it mean to break down a task into smaller steps?* *Why is it helpful to break a big problem into smaller parts?* *Can you think of an example of a big task or problem that you could break into smaller steps?* *How do we decide which steps to take first when breaking down a problem?* *What are some strategies we can use to figure out how to break down a problem into smaller parts?* *How do we know when we've finished one step and it's time to move on to the next one?* *What can we do if we get stuck on one step while trying to solve a problem?* *How does breaking a problem into smaller steps help us solve it more easily?* *Can you think of a time when you had to break down a big task into smaller steps to solve it?* *Why is it important to be patient and persistent when solving problems?*	
Academic Language	*Problem* *Break* *Divisions* *Task* *Parts* *Sections* *Multiple* *Pieces* *Bits* *Smaller* *Components* *Elements* *Steps* *Segments* *Portions*	
NYSED Examples	Example 1: When giving directions to other students, it may be possible to create a "named" sub-direction that can be a part of other directions (e.g., going to the cafeteria may start with going to the library).	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

	Example 2: Students could imagine a new student joined the class and is not familiar with the class routines. Then the students could discuss the different steps needed to get ready to go home from school that they would share with the new student. Example 3: When solving an addition problem, students can decompose one of the addends into the sum of two smaller numbers. The class can discuss the different decompositions they created. This could be used as part of the math making 10 strategy. (MATH)
Interdisciplinary Connections	***Mathematics*** • *Explore the concept of breaking down larger tasks into smaller steps using mathematical problem-solving strategies.* • *Practice breaking down math problems into manageable steps, such as identifying key information, selecting appropriate operations, and solving one step at a time.* ***Science*** • *Investigate the scientific method and how it involves breaking down complex questions or problems into smaller, manageable steps.* • *Learn about the steps of the scientific method—asking a question, making observations, forming a hypothesis, conducting experiments, analyzing data, and drawing conclusions—and how each step contributes to solving a scientific problem.* ***Language Arts*** • *Apply the concept of breaking down tasks into smaller steps to the process of writing and storytelling.* • *Learn about the steps involved in writing a story, such as brainstorming ideas, planning the plot, writing drafts, revising and editing, and publishing a final product.* • *Practice breaking down these steps into smaller, manageable tasks.* ***Social Studies*** • *Explore historical and contemporary examples of problem-solving and task management.* • *Learn about how people throughout history have tackled complex problems by breaking them down into smaller steps, such as building structures, solving conflicts, or inventing new technologies.* • *Discuss how teamwork and collaboration have played a role in solving large-scale problems.* ***Art***

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Apply the concept of breaking down tasks into smaller steps to the creative process of making art.*
- *Learn about the steps involved in creating artwork, such as sketching, planning, choosing materials, adding details, and finishing touches.*
- *Explore how artists break down complex subjects or compositions into smaller, manageable elements.*

Technology

- *Explore how computer programming involves breaking down tasks into smaller steps.*
- *Learn about algorithms and how they are used to solve problems by breaking them down into a sequence of smaller instructions.*
- *Practice writing simple algorithms to accomplish tasks, such as drawing shapes or playing games.*

Physical Education

- *Apply the concept of breaking down tasks into smaller steps to physical activities and sports.*
- *Learn about the steps involved in learning and mastering new physical skills, such as throwing a ball, jumping rope, or riding a bike.*
- *Practice breaking down these skills into smaller, manageable steps and setting goals for improvement.*

Additional Examples and Resources	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Computational Thinking: Abstraction and Decomposition

Standard	K-1.CT.5 Recognize that the same task can be described at different levels of detail.	
	Nouns	**Verbs**
	task *detail*	*recognize*
Clarifying Statement	Instructions to perform a task can be given with more or less detail but still achieve the same result.	
Focus Questions	*Can we follow different steps to e.g. tie our shoes, and still get the same outcome?* *Can we use multiple directions to complete the same task?* *What does it mean for a task to be described at different levels of detail?* *Can you think of a task that could be described with a lot of detail? How about with less detail?* *How do we decide how much detail to include when describing a task?* *What are some examples of tasks that can be completed successfully with varying levels of detail in the instructions?* *How does adding more detail to the instructions for a task affect the way it is completed?* *Can you give an example of a time when you followed instructions to complete a task, and the level of detail in the instructions affected your success?* *How do we know if we need to add more detail to the instructions for a task, or if the instructions are already clear enough?* *How does breaking a task down into smaller steps help us provide more detail in the instructions?* *Why is it important to be able to recognize when different levels of detail are needed in instructions?* *Can you think of a task where too much detail in the instructions might actually make it harder to complete?*	
Academic Language	*Task* *Different* *Describe* *Recognize* *Detail* *Computer* *Levels* *Science* *Same* *Specific*	
NYSED Examples	Example 1: Students could look at different classroom instructions, such as "put away the books in the green bin", and create other ways of explaining the instructions with more (e.g., put away the books in the green bin next to the bookshelf) and with less (e.g., put away the books) detail without changing the essence of the task.	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Interdisciplinary Connections	**Language Arts** ● Explore the concept of detail in storytelling and writing. ● Learn about how authors use descriptive language to provide more or less detail in their stories. ● Practice writing stories with varying levels of detail, and discuss how different levels of detail affect the reader's understanding and enjoyment of the story. **Mathematics** ● Apply the concept of detail to mathematical problem-solving. ● Learn about how mathematical problems can be solved using different levels of detail, such as breaking down complex problems into simpler steps or using more or fewer numbers in calculations. ● Explore how changing the level of detail affects the accuracy and efficiency of problem-solving strategies. **Science** ● Investigate the role of detail in scientific observations and experiments. ● Learn about how scientists use detailed observations and measurements to gather data and make conclusions about the natural world. ● Explore how changing the level of detail in scientific investigations affects the reliability and validity of the results. **Social Studies** ● Explore the concept of detail in historical and cultural narratives. ● Learn about how historical events and cultural practices can be described with varying levels of detail, depending on the perspective of the storyteller and the intended audience. ● Discuss how different levels of detail in historical accounts can affect our understanding of the past and our interpretation of current events. **Art** ● Apply the concept of detail to visual art and design. ● Learn about how artists use different levels of detail to create depth, texture, and emphasis in their artwork. ● Explore how changing the level of detail in their own art projects affects the overall composition and impact of the work. **Technology** ● Explore the role of detail in computer programming and digital design.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	● Learn about how programmers use detailed instructions to create software and digital applications. ● Explore how changing the level of detail in coding affects the functionality and usability of digital products. **Music** ● Apply the concept of detail to musical composition and performance. ● Learn about how musicians use different levels of detail in rhythm, melody, and harmony to create expressive and engaging music. ● Explore how changing the level of detail in their own musical compositions affects the mood and style of the music.
Additional Examples and Resources	*Giving directions (1 step vs 3 step)*

Standard	**K-1.CT.6** Follow an algorithm to complete a task.	
	Nouns	**Verbs**
	task *algorithm*	*follow* *complete*
Clarifying Statement	The task can be a familiar, daily activity or more abstract. Algorithms at this stage may be short, containing at least three steps, and focus on sequencing.	
Focus Questions	*How can you complete this task?* *What do you notice about____?* *What is the start and end?* *What steps do we use to complete a task (Specific task)?* *What do we use algorithms and sequencing for?* *What is an algorithm, and how does it help us complete tasks step by step?* *Can you give an example of a familiar daily activity that involves following a set of steps in order?* *How do we know if we have followed an algorithm correctly? What happens if we miss a step or do them out of order?* *Can you create your own algorithm for getting ready for bed, eating breakfast, or another daily routine?* *How do algorithms help us solve problems or complete tasks more efficiently?* *Can you think of some activities that might require following longer algorithms with more steps?* *How do we break down a larger task into smaller steps to create an algorithm?* *How can we use our knowledge of sequencing to tell stories or create patterns?* *Can you explain how algorithms are used in technology, such as in computer programming or robotics?* *How do we know when to stop following an algorithm and that we have completed our task successfully?*	
Academic Language	*Algorithm* *Code* *Task* *Computer* *Sequence* *Program* *Steps* *Complete* *Instructions*	

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Computational Thinking: Algorithms and Programming

NYSED Examples	Example 1: A teacher might lead students in following an algorithm that tells the class how to line up for recess. Students could follow an algorithm on how to build a simple structure with manipulatives (e.g., blocks, cups, etc.) or how to complete a simple classroom task. Example 2: Connect to math steps to show different ways to solve problems. (MATH) Example 3: Students could practice origami and learn how to follow simple directions to complete the task. (ARTS) Example 4: Students can write down algorithms for processes they do in class.
Interdisciplinary Connections	**Mathematics** • *Algorithms are essentially sequences of steps, making them closely related to mathematical sequences and patterns.* • *Explore the concept of algorithms through counting sequences, recognizing patterns, and understanding the order of operations in mathematical calculations.* **Science** • *Science experiments often involve following step-by-step procedures, akin to algorithms.* • *Learn about the scientific method, which is essentially an algorithm for conducting experiments.* • *Explore cause and effect relationships, which are often embedded in algorithms.* **Language Arts** • *Sequencing is a fundamental concept in storytelling.* • *Learn about storytelling structure, including the beginning, middle, and end, which mirrors the structure of algorithms.* • *Practice sequencing events in stories and understanding the logical flow of narratives.* **Technology** • *Algorithms are fundamental to computer science and programming.* • *Explore simple algorithms in coding activities, such as sequencing commands in a coding app to make a character move or perform actions.* • *This helps them understand the logic behind algorithms and how they are used in technology.* **Art** • *Creating art often involves following step-by-step instructions or procedures, much like algorithms.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Engage in art projects that require following a sequence of steps, such as drawing shapes or painting objects.*
- *Explore how different sequences of steps result in different artistic outcomes.*

Social Studies

- *Explore historical processes and events as algorithms.*
- *For example, they can learn about the steps involved in a historical event like the American Revolution or the Civil Rights Movement.*
- *Understanding historical processes as algorithms helps students grasp the logical flow of events over time.*

Physical Education

- *Physical activities often involve following sequences of movements or steps, similar to algorithms.*
- *Engage in activities that require following specific instructions or routines, such as stretching exercises or dance routines.*
- *This helps them understand the importance of sequencing in physical tasks.*

Health Education

- *Following algorithms for daily routines, such as brushing teeth or washing hands, is crucial for maintaining good health.*
- *Learn about the steps involved in these routines and understand why each step is important.*
- *This reinforces the concept of algorithms in everyday life.*

Additional Examples and Resources	*Read Charlie needs a Cloak by Tomie DePaolo. Organize pictures of the steps sequentially to complete the goal task*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Computational Thinking: Algorithms and Programming

Standard	**K-1.CT.7** Identify terms that refer to different concrete values over time.	
	Nouns	**Verbs**
	terms *values* *time*	*identify*

Clarifying Statement	The focus is on observing that people use certain terms/labels to refer to a concept (E.g., Today's Date, Today's Weather, Word of the Week, Today's Line Leader) whose specific value can change depending on the day or time.

Focus Questions	*Which terms/labels are constant and which ones change?* *What is the frequency of change?* *How many days in a _____?* *How many minutes long are centers?* *What is an algorithm?* *Can you give an example of a task that can be completed by following an algorithm?* *Why is it important to follow the steps of an algorithm in the correct order?* *How do we know if we have successfully completed a task using an algorithm?* *Can you identify the different steps in an algorithm?* *What happens if we skip a step or complete the steps out of order when following an algorithm?* *How can we create our own algorithms for everyday tasks?* *Can you think of a familiar daily activity and break it down into steps to create an algorithm?* *How do algorithms help us solve problems or complete tasks more efficiently?* *How can we apply the concept of algorithms to other areas of our lives, such as following directions or completing assignments?*

Academic Language	*Value* *Data* *Time* *Change* *Terms* *Number* *Different* *Pattern* *Concrete*

NYSED Examples	Example 1: Given a set of animals that live in the students' region, the teacher might have students come up with different possible labels for groups of like animals (e.g., birds, plant-eating animals, etc.). Then, the teacher can show the students how the

	animals in each labeled group might change when using animals from different regions. (SCIENCE) Example 2: Students could identify concepts in their classroom whose value changes, such as the current date, the current weather, or the current student in a particular classroom job.
Interdisciplinary Connections	***Mathematics*** ● *Explore the concept of time by learning about calendars, clocks, and understanding how values change over time.* ● *Learn about days of the week, months, seasons, and how to measure time using units like seconds, minutes, and hours.* ***Language Arts*** ● *This standard connects with language arts through vocabulary development.* ● *Explore how different words and labels are used to describe concepts that change over time.* ● *Practice reading and writing the terms associated with daily changes, such as the date, weather, and special events.* ***Science*** ● *Investigate the concept of change over time in science by observing natural phenomena like the weather, plant growth, and animal behavior.* ● *Learn to use scientific tools to record and track changes, such as thermometers for temperature, rain gauges for precipitation, and calendars for tracking seasonal changes.* ***Social Studies*** ● *In social studies, students can learn about the concept of time in historical contexts.* ● *Explore how people in the past measured time, how calendars have evolved over time, and how historical events have shaped our understanding of time.* ● *Learn about different cultures and their traditions related to timekeeping.* ***Art*** ● *Art can be used to visually represent the changes over time.* ● *Create calendars, weather charts, and other visual aids to track daily changes.* ● *Create artwork inspired by different seasons, weather patterns, and historical events related to time.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

	Technology ● *Technology can be used to enhance students' understanding of time and how values change over time.* ● *Use digital tools such as interactive calendars, weather apps, and multimedia resources to explore daily changes and trends over time.* ● *Learn basic coding concepts related to time, such as sequencing and loops.*
Additional Examples and Resources	

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Computational Thinking: Algorithms and Programming

Standard	**K-1.CT.8** Identify a task consisting of steps that are repeated and recognize which steps are repeated.	
	Nouns	**Verbs**
	task *steps*	*identify* *recognize*

Clarifying Statement	The focus should be on short tasks where there is repetition and having students identify and describe the repetition.

Focus Questions	*What are some tasks that require us to repeat the same steps more than once? Why do we need to repeat these steps more than once?* *What do we always do at the beginning of _____?* *What does it mean for a task to have steps that are repeated?* *Can you think of a task that you do regularly where you repeat certain steps?* *Why do you think some tasks involve repeating the same steps over and over again?* *How can we identify which steps are repeated in a task?* *What are some examples of tasks where you have noticed repeating steps?* *How does recognizing repeated steps help us understand how to complete a task more efficiently?* *Can you describe a task where you have to repeat a step multiple times to achieve the desired outcome?* *What strategies can we use to keep track of the steps we need to repeat in a task?* *How do you feel when you recognize that you are repeating steps in a task?* *Why is it important to be able to recognize and describe repetition in tasks we do?*

Academic Language	*Task* *Pattern* *Steps* *Sequence* *Repeated* *Algorithm* *Recognize* *Loop* *Identify* *Repetition*

NYSED Examples	Example 1: Students could identify simple tasks, like teeth brushing, that have repeated steps. Example 2: Students could play a familiar song (happy birthday) or recite a poem.

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Computational Thinking: Algorithms and Programming

Interdisciplinary Connections	**Mathematics**
	Repeated addition and multiplication are fundamental concepts in mathematics. *Explore repeated patterns in counting, such as skip counting by twos, fives, or tens.* *Practice recognizing and describing repetition in number sequences and patterns.* **Science** *The scientific method often involves repeating experiments to test hypotheses and gather data.* *Learn about the steps of the scientific method—asking a question, making observations, forming a hypothesis, conducting experiments, analyzing data, and drawing conclusions—and recognize the repetition of certain steps in the process.* **Language Arts** *Repetition is a common literary device used in poetry, songs, and stories.* *Identify and analyze repeated words, phrases, or patterns in poems and songs.* *Practice recognizing and describing repetition in the structure of stories, such as the repeated events in a fairy tale or the refrain in a song.* **Social Studies** *Historical events and cultural practices often involve repeated patterns and rituals.* *Learn about the significance of repetition in cultural ceremonies, holidays, and traditions.* *Explore how historical events can be understood as repeating patterns or cycles, such as the seasons or economic cycles.* **Art** *Repetition is a fundamental principle of art and design.* *Explore repeated patterns, shapes, colors, and textures in artworks.* *Learn about the use of repetition in creating rhythm, movement, and visual interest in art compositions.* **Technology** *In computer programming, loops are used to repeat a sequence of steps multiple times.*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

	- *Learn about loops and practice writing simple programs that involve repetition, such as drawing shapes or playing music.* - *Explore how repetition is used in algorithms to solve problems efficiently.* ***Physical Education*** - *In physical activities and sports, athletes often repeat certain movements or exercises to build strength, endurance, and muscle memory.* - *Learn about the importance of repetition in skill development and practice recognizing repeated movements in different sports and activities.* ***Health Education*** - *Healthy habits such as brushing teeth, washing hands, and exercising regularly involve repeated actions.* - *Learn about the importance of repetition in establishing and maintaining healthy routines.* - *Explore how repetition contributes to overall health and well-being.*
Additional Examples and Resources	*Use repetitive texts to identify repeated lines, repeated rhyming words* *Computer Engineering for Big Babies (ages 4-7)* *https://computerengineeringforbabies.com/products/computer-engineering-for-big-babies*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Computational Thinking: Algorithms and Programming

Standard	**K-1.CT.9** Identify and fix (debug) errors within a simple algorithm.	
	Nouns	**Verbs**
	error *algorithm*	*identify* *fix* *debug*
Clarifying Statement	The focus should be on identifying small errors within a simple algorithm and fixing the errors collaboratively.	
Focus Questions	*What does it mean to "debug" an algorithm?* *Can you think of an example of a simple algorithm that might have errors?* *Why is it important to be able to identify and fix errors in algorithms?* *How do we know if there is an error in an algorithm we are following?* *What are some strategies we can use to identify errors in algorithms?* *Once we've identified an error, how can we go about fixing it?* *Why is it helpful to work together with others when debugging an algorithm?* *Can you describe a time when you had to fix an error in a task or activity you were working on?* *What can we learn from fixing errors in algorithms?* *How does being able to identify and fix errors in algorithms help us become better problem solvers?* *How can we find errors/bugs in our algorithm/program?* *What ways can we fix the errors/bugs?*	
Academic Language	*Identify* *Simple* *Fix* *Computer* *Errors* *Science* *Debug* *Code* *Algorithm* *Problem*	
NYSED Examples	Example 1: As a class, students could create an algorithm for a classroom task, like sharpening pencils or washing hands, then try out the directions and fix any errors. Example 2: Students could use a simple robot to give directions on a grid. If they weren't successful in coding to the right location, the students could state where the bug was and how they can fix it. They can then reprogram the robot to see if their debugging was successful.	
Interdisciplinary Connections	**Mathematics** *Debugging errors in algorithms involves problem-solving skills, which are closely related to mathematical problem-solving.*	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- *Apply strategies they use in math, such as trial and error, breaking problems into smaller parts, and checking their work for accuracy, to identify and fix errors in algorithms.*

Science

- *Science experiments often require troubleshooting and debugging to ensure accurate results.*
- *Learn about the scientific method and how scientists use observation, experimentation, and analysis to identify and correct errors in their procedures.*
- *Explore the role of experimentation and iteration in the scientific process.*

Language Arts

- *Debugging errors in writing involves revising and editing to improve clarity, coherence, and accuracy.*
- *Learn about the writing process and practice revising their writing to correct spelling, grammar, punctuation, and other errors.*
- *Collaborate with peers to provide feedback and suggestions for improvement.*

Technology

- *Debugging is a fundamental skill in computer science and programming.*
- *Learn about debugging techniques, such as tracing code, identifying syntax errors, and testing programs to find and fix bugs.*
- *Practice debugging simple programs and algorithms using educational coding platforms and tools.*

Art

- *Debugging errors in artwork involves problem-solving and creative thinking.*
- *Learn about the artistic process and practice revising their artwork to correct mistakes, improve composition, and enhance visual appeal.*
- *Collaborate with peers to share ideas and strategies for debugging artwork.*

Social Studies

- *Debugging errors in historical narratives involves critical thinking and analysis.*
- *Learn about historical events and explore how different perspectives and interpretations can lead to errors or inaccuracies in historical accounts.*
- *Collaborate to identify and correct errors in historical texts and sources.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

	Physical Education • *Debugging errors in physical activities involves refining technique and improving performance.* • *Learn about the importance of feedback and practice in mastering new skills, such as throwing, catching, kicking, or jumping.* • *Collaborate with peers and coaches to identify and correct errors in their movements and techniques.*
Additional Examples and Resources	

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Computational Thinking: Algorithms and Programming

Standard	**K-1.CT.10** Collaboratively create a plan that outlines the steps needed to complete a task.	
	Nouns	**Verbs**
	steps *tasks*	*collaborate* *plan* *outline*
Clarifying Statement	The focus should be on collaboratively identifying a planning process which can be written, drawn, or spoken.	
Focus Questions	*What does it mean to create a plan?* *Why is it important to create a plan before starting a task?* *How do we decide what steps to include in a plan?* *What are some examples of tasks that require planning?* *How can we work together as a team to create a plan?* *What are some different ways we can create and communicate plans (e.g., writing, drawing, speaking)?* *How do we make sure everyone's ideas are heard and considered when creating a plan collaboratively?* *What do we do if we disagree about the steps in a plan?* *How do we know if a plan is well-thought-out and effective?* *Can you think of a time when creating a plan helped you complete a task more successfully?* *What types of plans or steps do we use to complete a task?What is a good plan to solve this?*	
Academic Language	*Plan*　　　　　　*Science* *Steps*　　　　　*Teamwork* *Task*　　　　　　*Strategy* *Collaboratively*　*Goal* *Computer*　　　　*Project*	
NYSED Examples	Example 1: Students could develop a plan with the class to compare two characters in a story. The class could create a chart to document their comparison with sections of the document numbered to correspond to each step of the plan. (ELA) Example 2: Have students outline the steps to tying their shoes or getting ready for lunch and create a diagram showing each of the steps.	
Interdisciplinary Connections	***Mathematics*** *Planning often involves organizing information and sequencing steps, which are mathematical concepts.*	

Impacts of Computing　　**Computational Thinking**　　**Networks and Systems Design**　　**Cybersecurity**　　**Digital Literacy**

- *Explore the concept of sequencing by creating plans with a specific order of steps.*
- *Practice counting and measuring as they plan tasks that involve quantities or measurements.*

Language Arts

- *Planning requires effective communication and language skills.*
- *Practice expressing their ideas clearly and listening to others' ideas as they collaborate to create a plan.*
- *Develop their vocabulary and language comprehension as they discuss and explain the steps needed to complete a task. Students can create "how-to" stories.*

Science

- *Planning is an essential part of the scientific process.*
- *Learn about the steps of the scientific method—asking questions, making predictions, conducting experiments, analyzing data, and drawing conclusions—and apply these steps to planning tasks or experiments in other subject areas.*
- *They can also explore how planning helps scientists organize their thoughts and resources to achieve their goals.*

Social Studies

- *Planning involves considering the needs and perspectives of others, which is a key aspect of social studies.*
- *Learn about collaboration and teamwork as they work together to create plans.*
- *Explore how planning plays a role in different aspects of society, such as urban planning, event planning, and community development.*

Art

- *Planning often involves visualizing ideas and creating visual representations of tasks or projects.*
- *Use art techniques such as drawing, painting, or collage to create visual plans or diagrams that outline the steps needed to complete a task.*
- *Explore how visual planning can help them organize their thoughts and communicate their ideas effectively.*

Technology

- *Planning is an important part of technology design and development.*
- *Learn about the design process and apply it to planning tasks or projects.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

	● *Explore how technology tools and software can be used to create digital plans or prototypes of tasks or projects.* ***Physical Education*** ● *Planning is essential for setting goals and developing action plans for physical activities and sports.* ● *Learn about the importance of planning their workouts, practices, or games to achieve their fitness and performance goals.* ● *Explore how planning helps them stay organized and motivated to succeed in physical activities.*
Additional Examples and Resources	*Students could create a recipe to make a PB & J.* *Students could create directions to create a small Lego design.*

Networks and Systems Design

Computing devices typically do not operate in isolation. Networks connect computing devices to share data and resources and are an increasingly integral part of computing. Networks and communication systems provide greater connectivity in the computing world by providing fast, secure communication, and facilitating innovation. Individuals interact with data using a variety of input and output devices that are part of a more complex computing system. The hardware and software that make up a computing system process data in digital form. A basic understanding of hardware and software is useful when troubleshooting a computing system that does not work as intended.

The Networks and Systems Design standards aim to prepare students to understand the basic functioning of the computing systems and networks that are used as fundamental tools in our personal and professional lives.

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Networks and Systems Design: Hardware & Software

Standard	**K-1.NSD.1** Identify ways people provide input and get output from computing devices.	
	Nouns	**Verbs**
	people *devices*	*identify*
Clarifying Statement	The emphasis is on understanding that humans and computers interact through inputs and outputs and identifying examples in their daily lives.	
Focus Questions	*What are some examples of computing devices that you use in your daily life?* *How do you interact with these devices to give them information or commands?* *What happens when you press a button, tap on a screen, or speak into a device?* *Can you think of different ways people can input information into a computer or device?* *What types of information or data can you receive from a computer or device?* *How do you know when a device has responded to your input?* *Can you describe a time when you used a computer or device to solve a problem or complete a task?* *How do people use technology to communicate with each other?* *What are some examples of technology helping people in their daily lives?* *How can we use technology responsibly and safely?* *How do people put information into a computer?* *What ways do people get information from a computer?*	
Academic Language	*Input* *People* *Output* *Interaction* *Computing* *Technology* *Devices* *Screen* *Ways* *Button*	
NYSED Examples	Example 1: Students could label a diagram of a computing system with the words input and output, or students could sort images of computer components into input and output columns on a t-chart. Example 2: Students can identify examples of input/output in their daily lives (e.g., putting money into a vending machine and getting out a ticket/soda/toy) and work with the teacher to group the examples into the input or output categories.	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

	Example 3: Print pictures of different computer devices that students experience every day. Include pictures of things that might have computer components, but students might not realize are computers (e.g., cash register). Example 4: Discuss how input and output can be similar to our 'human senses', such as hearing is input, and touch is both input/output.
Interdisciplinary Connections	*Mathematics* • *Understanding inputs and outputs involves logical thinking and problem-solving skills, which are closely related to mathematical concepts.* • *Explore the concept of input-output relationships through simple math problems, such as addition and subtraction equations or number patterns.* • *Practice predicting outputs based on given inputs and vice versa.* *Language Arts* • *Interacting with computing devices often involves using language and communication skills.* • *Learn about different types of inputs, such as typing on a keyboard, speaking into a microphone, or tapping on a touchscreen.* • *Explore how computers generate outputs in the form of text, images, sounds, or videos, and how to interpret and respond to these outputs.* *Science* • *Computing devices rely on hardware and software components to process inputs and generate outputs.* • *Learn about the basic components of computers, such as input devices (e.g., keyboards, mice, touchscreens) and output devices (e.g., monitors, speakers, printers).* • *TExplore how computers use algorithms and programming to process inputs and produce outputs.* *Social Studies* • *Technology plays a significant role in society, affecting how people communicate, work, and interact with each other.* • *Learn about the impact of computing devices on daily life and explore how different communities and cultures use technology for input and output activities.* • *Discuss ethical considerations related to privacy, security, and digital citizenship when using computing devices.* *Art*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

	- *Creating digital artwork or multimedia presentations involves providing input to computing devices and receiving outputs in the form of visual or auditory content.* - *Explore how digital art tools and software allow them to express their creativity and produce multimedia projects.* - *Learn about the role of technology in art and design careers.* ***Technology*** - *Computing devices are integral to technology education, as they provide opportunities for students to learn about hardware, software, and digital literacy skills.* - *Explore different types of computing devices, such as computers, tablets, smartphones, and smart devices, and learn how to use them effectively for input and output activities.* - *Practice troubleshooting common issues and adapting to new technologies.* ***Physical Education*** - *Fitness trackers and exercise apps are examples of computing devices that people use to track inputs such as steps taken or calories burned and receive outputs such as activity summaries or goal achievements.* - *Explore how technology can support health and fitness goals and learn about the benefits and limitations of using computing devices for physical activity tracking.*
Additional Examples and Resources	

Networks and Systems Design: Hardware & Software

Standard	**K-1.NSD.2** Identify basic hardware components that are found in computing devices.	
	Nouns	**Verbs**
	hardware *component*	*identify* *compute*
Clarifying Statement	Basic hardware components are the parts that students can see, such as monitor/screen, keyboard, mouse, etc.	
Focus Questions	*What are some examples of hardware components that you can find in a computing device?* *How do you interact with these hardware components when using a computer or device?* *Can you describe the function of each hardware component?* *What does each hardware component look like?* *How are hardware components connected to each other to form a computing device?* *Why is it important to know about hardware components when using a computer or device?* *Can you identify the different parts of a computer or device by name?* *How do hardware components work together to perform tasks on a computer or device?* *Can you think of any other devices or machines that have similar hardware components?* *How can we take care of hardware components to make sure they last a long time?*	
Academic Language	*Hardware* *Components* *Computing* *Devices* *Basic* *Computer* *Science* *Parts* *Technology* *Screen* *Keyboard* *Mouse* *Buttons* *Speaker* *Casing* *Charger* *Ports* *Battery* *Camera*	
NYSED Examples	Example 1: Using images of different computing devices (e.g., computer station, tablet, printer), students could match labels with hardware components. Example 2: Students can create a technology vocabulary journal. (ELA) Example 3: Students can compare devices that do (e.g., a smart board marker, a calculator, a tablet) with those that do not (e.g., a pencil, an abacus, a book).	
Interdisciplinary Connections	***Mathematics***	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Understanding basic hardware components involves spatial reasoning and recognizing geometric shapes.*
- *Explore the shapes and sizes of different hardware components, such as rectangular monitors, circular buttons on a mouse, or square keys on a keyboard.*
- *Practice counting and comparing quantities of hardware components, such as the number of keys on a keyboard or the number of ports on a computer.*

Language Arts

- *Learning about hardware components involves building vocabulary and descriptive language skills.*
- *Learn the names of different hardware components and practice describing their features and functions.*
- *Explore how hardware components work together to perform tasks and communicate ideas, and practice explaining these concepts in their own words.*

Science

- *Understanding hardware components requires knowledge of how machines and technology work.*
- *Learn about the basic principles of electronics and mechanics, such as how electricity powers devices and how mechanical parts like keys and buttons trigger actions.*
- *Explore how hardware components are manufactured and assembled, and how they interact with software to perform tasks.*

Social Studies

- *Technology is a significant part of modern society, influencing how people work, communicate, and interact with each other.*
- *Learn about the history of computing devices and how they have evolved over time.*
- *Explore the role of technology in different cultures and communities, and discuss how access to technology can impact people's lives and opportunities.*

Art

- *Designing hardware components involves principles of art and design.*
- *Students can learn about the aesthetics of hardware design, such as the use of color, shape, and texture to create visually appealing products.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Explore how ergonomic design principles are used to make hardware components comfortable and easy to use for people of all ages and abilities.*

Technology

- *Learning about hardware components is a fundamental part of technology education.*
- *Learn about the basic functions and features of hardware components, such as input devices (e.g., keyboards, mice, touchscreens), output devices (e.g., monitors, printers, speakers), and storage devices (e.g., hard drives, flash drives).*
- *Explore how hardware components are connected and communicate with each other to perform tasks.*

Physical Education

- *Understanding hardware components can relate to physical health and ergonomics.*
- *Learn about the importance of proper posture and ergonomic setup when using computing devices, such as maintaining a neutral wrist position when typing on a keyboard or positioning a monitor at eye level to reduce neck strain.*
- *Explore how physical activity and breaks from screen time contribute to overall health and well-being.*

Additional Examples and Resources	*videos/ use kiddle* *Compare devices from past to present day to show the progress of technology.*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Networks and Systems Design: Hardware & Software

Standard	**K-1.NSD.3** Identify basic hardware and/or software problems.	
	Nouns	**Verbs**
	hardware *software* *problems*	*identify*
Clarifying Statement	The focus is on identifying the source of a common hardware/software problem (such as low battery, speakers not connected) with teacher guidance.	
Focus Questions	*What does it mean when something is not working properly on a computer or device?* *Can you give an example of a problem you've encountered with a computer or device?* *How do you know if a problem is caused by hardware or software?* *What are some signs that a hardware component might be malfunctioning?* *How can you tell if a software program is not working correctly?* *What are some common hardware problems that people might encounter?* *What are some common software problems that people might encounter?* *What steps can you take to troubleshoot a hardware problem?* *What steps can you take to troubleshoot a software problem?* *Why is it important to be able to identify and fix problems with computers and devices?*	
Academic Language	*Hardware* *Issue* *Software* *Glitch* *Problems* *Error* *Bug*	
NYSED Examples	Example 1: Students might notify a teacher when an application or device is not working as expected. Rather than saying, "It doesn't work," a student might describe things like, "The device will not turn on," or "The sound doesn't work."	
Interdisciplinary Connections	***Mathematics*** *Problem-solving involves logical thinking and reasoning skills, which are closely related to mathematical concepts.* *Explore the steps of problem-solving, such as identifying the problem, brainstorming solutions, testing solutions, and evaluating outcomes.*	

Impacts of Computing **Computational Thinking** **Networks and Systems Design** **Cybersecurity** **Digital Literacy**

- *Practice counting and comparing quantities related to hardware and software problems, such as the number of devices affected or the time it takes to fix the problem.*

Language Arts

- *Identifying and describing problems involves communication and language skills.*
- *Learn vocabulary related to hardware and software problems, such as "battery," "speaker," "error message," or "restart."*
- *Practice explaining their observations and hypotheses about the causes of problems, as well as describing the steps they take to troubleshoot and fix problems.*

Science

- *Understanding hardware and software problems requires knowledge of how machines and technology work.*
- *Learn about the basic principles of electronics, mechanics, and programming that underlie hardware and software functions.*
- *Explore how environmental factors, wear and tear, and user actions can affect the performance of hardware and software components.*

Social Studies

- *Technology is a significant part of modern society, influencing how people work, communicate, and interact with each other.*
- *Learn about the impact of technology on daily life and explore how different communities and cultures use technology to solve problems and improve efficiency.*
- *Discuss the ethical considerations related to technology use, such as privacy, security, and digital citizenship.*

Art

- *Troubleshooting hardware and software problems involves observation and critical thinking skills, which are also important in art and design.*
- *Practice looking closely at visual cues and patterns to identify problems, such as error messages or unusual behavior in software applications.*
- *Explore how design principles, such as simplicity, clarity, and usability, can influence the effectiveness of hardware and software solutions.*

Technology

- *Identifying and fixing hardware and software problems is a fundamental part of technology education.*

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

	• *Learn about common hardware and software problems, such as connectivity issues, software crashes, or hardware malfunctions, and practice troubleshooting techniques to diagnose and resolve these problems.* • *Explore how technology tools and resources, such as diagnostic software, online forums, and user manuals, can help them solve problems more efficiently.*
Additional Examples and Resources	*Create a T chart of possible problems faced and then solutions to the problems.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Standard	K-1.NSD.4 Identify how protocols/rules help people share information over long distances.	
	Nouns	**Verbs**
	protocols *rules* *information* *long distance*	*identity*

Clarifying Statement	The focus is on how information is conveyed from one individual to another and the rules that allow for communication and data sharing, such as envelopes need addresses/emails need email addresses to reach the right person.

Focus Questions	*What does it mean to have rules or protocols for sharing information?* *Can you give examples of rules or protocols that help people communicate over long distances?* *How do rules and protocols ensure that information reaches the right person or destination?* *What happens if someone doesn't follow the rules or protocols for communication?* *How do rules and protocols for communication differ depending on the method used (e.g., sending a letter, making a phone call, sending an email)?* *Why is it important to have rules and protocols for communication, especially over long distances?* *Can you think of ways that rules and protocols for communication have changed over time?* *How do rules and protocols for communication help keep information private and secure?* *What role do addresses and contact information play in following communication rules and protocols?* *How can we ensure that we are following the rules and protocols for communication in our daily lives?* *What is considered long distance?* *How can we send an email to someone? Instant message? Text?*

Academic Language	*Protocol* *Communication* *Rules* *Network* *Share* *Internet* *Information* *Message* *Long distances* *Connection*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYSED Examples	Example 1: Students could explain how they would send a letter to a person in another city. They can identify the rules for mailing letters (e.g., using stamps), and why those rules exist (e.g., because getting the letter from point A to point B involves lots of different people). The rules help keep everything coordinated. Example 2: Students can pretend to be parts of a network and play the game "telephone" to understand how a message can travel.
Interdisciplinary Connections	***Mathematics*** ● *Understanding protocols and rules involves logical thinking and sequencing skills, which are closely related to mathematical concepts.* ● *Explore the concept of sequencing by learning about the order in which information is transmitted and received over long distances.* ● *Practice counting and comparing quantities related to communication protocols, such as the number of steps in a process or the number of messages sent and received.* ***Language Arts*** ● *Communication involves language and literacy skills.* ● *Learn vocabulary related to communication protocols, such as "address," "email," "protocol," or "rules."* ● *Practice reading and writing messages using different communication methods, such as writing letters, sending emails, or making phone calls.* ● *Explore how language is used to convey information effectively and respectfully in different contexts.* ***Science*** ● *Understanding communication protocols requires knowledge of how information is transmitted and received over long distances.* ● *Learn about the basic principles of communication, such as encoding and decoding messages, transmitting and receiving signals, and error correction techniques.* ● *Explore how different communication technologies, such as telephones, radios, and computers, use protocols to exchange information reliably and efficiently.* ***Social Studies*** ● *Communication is a fundamental aspect of human society and culture.* ● *Learn about the history of communication technologies and how they have evolved over time, from ancient methods such as smoke signals and carrier pigeons to modern technologies such as the internet and social media.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- *Explore how communication protocols shape social interactions and relationships, such as the etiquette and norms associated with different communication methods.*

Art

- *Visual communication is an important aspect of conveying information over long distances.*
- *Explore how visual elements, such as symbols, signs, and graphics, are used to communicate messages effectively and universally.*
- *Learn about the design principles behind visual communication, such as clarity, simplicity, and visual hierarchy, and apply these principles to create their own visual messages.*

Technology

- *Communication protocols are a fundamental part of technology education.*
- *Learn about different types of communication protocols, such as TCP/IP for internet communication or SMTP for email communication.*
- *Explore how protocols ensure that information is transmitted securely and reliably over long distances, and how they enable different devices and systems to communicate with each other.*
- *Learn about the importance of digital citizenship and online safety when communicating over the internet.*

Social emotional

- *Sharing/ need for rules*

Additional Examples and Resources	*Students play the telephone game – we need rules for sharing information clearly*
	"Turn, talk, affirm" is a protocol we use for communicating
	Students identify rules at home and school for sharing information (Connects with K-1.IC.2)
	Identify the parts/information required to send a message, email, etc. e.g. phone number, email addresses, user names.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Standard	**K-1.NSD.5** Identify physical devices that can store information.	
	Nouns	**Verbs**
	physical *device* *information*	*identify*
Clarifying Statement	The focus is on recognizing that common computing devices can store information, including computers, tablets, phones, and calculators.	
Focus Questions	*What does it mean for a device to "store" information?* *Can you name some devices that you use that store information?* *How do these devices store information?* *What kinds of information can be stored on these devices?* *How do you access the information stored on these devices?* *Can you think of different ways you might use these devices to store information?* *How do you know if a device has enough space to store the information you want to save?* *Why is it important to keep information stored on these devices safe?* *How do you decide which device to use to store different types of information?* *Can you explain how you would store and retrieve information using one of these devices?*	
Academic Language	*Device* *Store* *Information* *Physical* *Computer*	*Device* *Store* *Information* *Physical* *Computer*
NYSED Examples	Example 1: Students can make a list of devices they use at home and at school that store their name.	
Interdisciplinary Connections	*Mathematics* *Understanding physical devices that store information involves concepts related to quantity and measurement.* *Explore the capacity of different storage devices, such as how many pictures or videos a phone can hold, or how many files a computer can store.*	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- *Practice counting and comparing quantities, such as the number of songs on a music player or the number of apps on a tablet.*

Language Arts

- *Learning about physical devices that store information involves building vocabulary and descriptive language skills.*
- *Learn the names of different storage devices, such as "hard drive," "memory card," "flash drive," or "cloud storage."*
- *Practice describing the features and functions of these devices using descriptive language and comparing their similarities and differences.*

Science

- *Understanding storage devices requires knowledge of how data is stored and retrieved.*
- *Learn about the basic principles of data storage, such as binary code and magnetic or electronic storage methods.*
- *Explore how different types of storage devices work, such as hard disk drives, solid-state drives, and optical discs, and how they store and access data.*

Social Studies

- *Technology is a significant part of modern society, influencing how people work, communicate, and interact with each other.*
- *Learn about the impact of storage devices on daily life and explore how different communities and cultures use technology to store and access information.*
- *Discuss the ethical considerations related to data storage, such as privacy, security, and digital citizenship.*

Art

- *Designing storage devices involves principles of art and design.*
- *Learn about the aesthetics of device design, such as the shape, color, and texture of different storage devices.*
- *Explore how ergonomic design principles are used to make storage devices comfortable and easy to use for people of all ages and abilities.*

Technology
- *Learning about storage devices is a fundamental part of technology education.*
- *Learn about different types of storage devices, such as internal and external hard drives, USB flash drives, memory cards, and cloud storage services.*

	- *Explore how storage capacity and speed affect the performance of storage devices, and how to safely store and manage data to prevent loss or corruption.* - *Learn about the importance of data backup and recovery strategies to protect valuable information.*
Additional Examples and Resources	*Create a t-chart of devices used at home vs. at school that have your name or store information for you* *Create a graphic organizer (flow chart) around the word "information" (name, birthday, phone number)* *T chart of devices that can store info vs ones that do not.*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Cybersecurity

In a digital world, all individuals have a responsibility to protect data and the computing resources they access. Cybersecurity encompasses the physical, digital, and behavioral actions that can be taken to increase this security. These measures are meant to ensure the confidentiality and integrity of data and computing resources, as well as ensure that they are accessible to the users who are supposed to have access to them. Digital security includes understanding and identifying risks, implementing appropriate safeguards, and being prepared to respond to potential attacks.

The Cybersecurity standards prepare students to understand why data and computing resources need to be protected, who might access them, and why they might do so whether intentionally malicious or not. It is important that students know how to employ basic safeguards to protect data and computing resources and how to appropriately respond if a breach occurs.

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Cybersecurity: Risks

Standard	K-1.CY.1 Identify reasons for keeping information private.	
	Nouns	**Verbs**
	information	*identify*
Clarifying Statement	The focus should be on discussing the reasons to keep certain information public (information you share with others) or private (information you keep to yourself or only share with your family).	
Focus Questions	*What is the difference between public and private?* *What does it mean to keep information private?* *Can you think of some examples of information that should be kept private?* *Why is it important to keep certain information private?* *How do you decide what information to share with others and what to keep private?* *What are some consequences of sharing personal information with strangers?* *How can you tell if someone is asking for information that should be kept private?* *What are some ways you can protect your privacy online?* *How do you feel when someone respects your privacy?* *Can you think of a time when keeping information private helped keep you safe?* *Why is it important to respect other people's privacy and personal boundaries?*	
Academic Language	*Private* *Information* *Keep* *Secret* *Safe*	*Private* *Information* *Keep* *Secret* *Safe*
NYSED Examples	Example 1: Students could discuss what might happen if they post information on a bulletin board in the hallway of school (public) about a surprise birthday party for a classmate (private).	
Interdisciplinary Connections	***Social Studies*** *Understanding privacy involves concepts related to personal boundaries and societal norms.*	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Learn about the importance of privacy in different cultures and communities and explore how privacy laws and regulations protect individuals' rights to keep information private.*
- *Discuss the role of consent and respect for personal boundaries in relationships and interactions with others.*

Language Arts

- *Exploring reasons for keeping information private involves developing vocabulary and communication skills.*
- *Learn about different types of personal information, such as names, addresses, phone numbers, and passwords, and practice describing why certain information should be kept private.*
- *Explore how to communicate boundaries and assert their rights to privacy in different situations.*

Mathematics

- *Understanding privacy involves concepts related to data security and encryption.*
- *Learn about the importance of protecting sensitive information, such as financial or medical data, from unauthorized access or disclosure.*
- *Explore how encryption techniques, such as passwords and encryption keys, help keep information private and secure.*

Science

- *Understanding privacy involves concepts related to information technology and cybersecurity.*
- *Learn about the risks and consequences of sharing personal information online, such as identity theft, cyberbullying, and online harassment.*
- *Explore how to use technology safely and responsibly to protect their privacy and personal information.*

Art

- *Exploring privacy involves expressing personal boundaries and preferences through creative expression.*
- *Students can create artwork that represents their ideas about privacy and personal space, such as drawings or collages that depict scenes of people respecting each other's privacy.*
- *Explore how visual elements, such as colors, shapes, and symbols, can convey messages about privacy and security.*

Technology

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

Cybersecurity: Risks

	- *Understanding privacy involves concepts related to digital citizenship and online safety.* - *Learn about the importance of setting privacy settings on social media accounts and online profiles to control who can see their personal information.* - *Explore how to recognize and respond to online threats, such as phishing scams and malware attacks, that can compromise their privacy and security.* ***Physical Education*** - *Understanding privacy involves concepts related to personal boundaries and physical safety.* - *Learn about the importance of respecting others' personal space and privacy during physical activities and interactions.* - *Explore how to assert their own boundaries and communicate their preferences for privacy and personal space in different situations.*
Additional Examples and Resources	*Create a T- chart of public vs private information. Provide examples so that students can place them on chart.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Cybersecurity: Safeguards

Standard	**K-1.CY.2** Identify simple ways to help keep accounts secure.	
	Nouns	**Verbs**
	account *secure*	*identify*
Clarifying Statement	The emphasis is on having a basic understanding of ways to keep accounts secure, such as having a passwords/pass codes.	
Focus Questions	*What is an account, and why is it important to keep it secure?* *Can you give examples of accounts that you have?* *What are some simple ways to keep your accounts safe?* *Why is it important to use a strong password or passcode?* *How can you create a strong password that's easy to remember?* *What should you do if someone else tries to access your account?* *Why is it important not to share your password with others?* *Can you think of any other ways to keep your accounts secure?* *What are some signs that someone might be trying to access your account without permission?* *How can you help others learn about keeping their accounts secure?*	
Academic Language	*Secure* *Keep* *Account* *Protect* *Safe* *Login* *Password* *Username* *Secret* *Lock*	
NYSED Examples	Example 1: Students could demonstrate that they know how to log in and out of any devices and accounts used for classroom work or other applications. Example 2: Discuss why passwords are important and what makes a password strong or weak.	
Interdisciplinary Connections	**Social Studies** - Understanding account security involves concepts related to personal safety and citizenship. - Learn about the importance of protecting personal information and privacy online, as well as the rights and responsibilities of digital citizens. - Explore how to recognize and respond to online threats, such as phishing scams or cyberbullying, that can compromise their account security. **Language Arts**	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- Exploring account security involves developing vocabulary and communication skills.
- Learn about different terms related to account security, such as "password," "passcode," "username," and "authentication."
- Practice explaining why it's important to keep accounts secure and how to create strong, unique passwords.

Mathematics

- Understanding account security involves concepts related to patterns and sequences.
- Learn about the importance of using complex passwords that include a combination of letters, numbers, and symbols.
- Explore how to create and remember passwords using mnemonic devices or password managers.

Science

- Understanding account security involves concepts related to technology and cybersecurity.
- Learn about the risks and consequences of unauthorized access to accounts, such as identity theft or data breaches.
- Explore how encryption techniques, such as two-factor authentication or biometric authentication, help keep accounts secure.

Art

- Exploring account security involves expressing creativity and individuality through visual expression.
- Create artwork that represents their ideas about account security, such as drawings or collages that depict scenes of people using strong passwords or protecting their accounts from hackers.
- Explore how visual elements, such as colors, shapes, and symbols, can convey messages about security and protection.

Technology

- Understanding account security involves concepts related to digital literacy and online safety.
- Learn about different strategies for keeping accounts secure, such as creating strong passwords, avoiding sharing passwords with others, and enabling security features like two-factor authentication.
- Explore how to recognize and respond to signs of suspicious activity on their accounts, such as unauthorized login attempts or unusual changes to account settings.

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

Additional Examples and Resources	*T-chart to determine which accounts need passwords. How to create a password. Password requirements.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Cybersecurity: Safeguards

Standard	K-1.CY.3 *This Standard begins in Grade Band 2-3*	
	Nouns	**Verbs**
Clarifying Statement		
Focus Questions		
Academic Language		
NYSED Examples		
Additional Examples and Resources		
Interdisciplinary Connections		

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Cybersecurity: Safeguards

Standard	**K-1.CY.4** Decode a word or short message using a simple code.	
	Nouns	**Verbs**
	word *message* *code*	*decode*
Clarifying Statement	The focus is on having students look at a string of symbols and giving them a key to substitute letters for the symbols to spell a word.	
Focus Questions	• *What is a code, and why do people use them?* • *Can you give an example of a code or cipher?* • *How do you decode a message using a simple code?* • *What does it mean to substitute one thing for another in a code?* • *Why is it important to have a key or guide when decoding a message?* • *How can you tell if you've decoded a message correctly?* • *Can you create your own simple code to encode a message?* • *What strategies can you use to decode a message if you're having trouble?* • *How does decoding messages using a code relate to language and literacy skills?* • *What are some real-life examples of when people might use codes to communicate?*	
Academic Language	*Decode* *Cipher* *Message* *Alphabet* *Code* *Puzzle* *Secret* *Hidden*	
NYSED Examples	Example 1: Students could brainstorm different ways to send a secret message. Example 2: Students can use coded messages to learn letters and sounds. (ELA)	
Interdisciplinary Connections	**Mathematics** • Decoding a simple code involves understanding patterns and sequences, which are mathematical concepts. • Learn about the process of substitution in coding, where each symbol represents a different letter of the alphabet. • Practice recognizing and extending patterns in the code, such as the order of symbols or the relationship between symbols and letters. **Language Arts**	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Decoding a message using a simple code involves building literacy and language skills.
- Learn about different types of codes and ciphers, such as substitution ciphers or picture codes.
- Practice decoding messages by matching symbols to letters of the alphabet and sounding out words phonetically.

Art

- Creating and decoding codes involves creativity and visual expression.
- Explore different ways to represent letters and symbols in their own codes, such as using shapes, colors, or pictures.
- Practice creating and decoding messages using visual elements, such as drawing lines or arranging objects in a specific order.

Science
- Understanding codes and ciphers involves concepts related to encryption and data security.
- Learn about the history of cryptography and how codes have been used throughout history to communicate secret messages.
- Explore how modern encryption techniques use complex algorithms and mathematical principles to protect sensitive information.

Social Studies

- Decoding messages using a simple code can relate to historical events and cultural practices.
- Learn about famous historical codes and ciphers, such as the Caesar cipher or the Enigma machine used during World War II.
- Explore how different cultures and societies have used codes and ciphers for communication and secrecy.

Technology

- Decoding messages using a simple code involves concepts related to technology and digital literacy.
- Learn about the role of computers and software in creating and decoding codes, as well as the importance of data security and privacy online.
- Explore how coding and cryptography are used in modern technology, such as in computer programming and cybersecurity.

Additional Examples and Resources	*Students can use code to decode a message related to the topic. Escape rooms. Decoding key.* *Math riddles*

Impacts of Computing · Computational Thinking · Networks and Systems Design · Cybersecurity · Digital Literacy

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

NYS Learning Technology Grant 2021-2024

Dryden/Groton Consortium

Cybersecurity: Response

Standard	**K-1.CY.5** Identify when it is appropriate to open and/or click on links or files.	
	Nouns	**Verbs**
	appropriate *link* *file*	*identify*
Clarifying Statement	The emphasis is on recognizing when it is safe and appropriate for students to open links, with teacher guidance.	
Focus Questions	*What is a link, and what happens when you click on one?* *How can you tell if a link is safe to click on?* *Why is it important to be cautious when clicking on links or downloading files?* *What are some signs that a link or file might be unsafe?* *Who can you ask for help if you're not sure if a link or file is safe to open?* *What should you do if you receive an email or message with a link from someone you don't know?* *Can you think of any rules or guidelines for staying safe online when it comes to clicking on links or files?* *How can you verify if a website or source is trustworthy before clicking on a link?* *What are some ways you can protect your computer or device from viruses and malware?* *Why is it important to be a responsible digital citizen and follow safe online practices?*	
Academic Language	*Safe* *Secure* *Trusted* *Permission*	
NYSED Examples	Example 1: Based on classroom rules, students could explain when and where it is appropriate to click on links which can be words, pictures, etc.	
Interdisciplinary Connections	**Social Studies** - Understanding when it is appropriate to open links or files involves concepts related to digital citizenship and online safety. - Learn about the rights and responsibilities of digital citizens, including how to recognize and avoid online risks such as malware, phishing scams, and inappropriate content.	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Explore the importance of respecting copyright and intellectual property rights when accessing digital content.

Language Arts

- Exploring online safety involves developing vocabulary and communication skills.
- Learn about different types of online threats and how to recognize warning signs, such as suspicious email addresses or messages.
- Practice explaining why it's important to be cautious when clicking on links or downloading files, and how to communicate concerns or questions to a trusted adult.

Mathematics

- Understanding online safety involves concepts related to data analysis and risk assessment.
- Learn about the risks and consequences of clicking on links or files without proper verification, such as identity theft, data breaches, or computer viruses.
- Explore how to evaluate the credibility and reliability of online sources, such as checking for reputable sources and verifying information before sharing it with others.

Science

- Understanding online safety involves concepts related to technology and cybersecurity.
- Learn about different types of online threats, such as viruses, malware, and phishing scams, and how they can affect computers and devices.
- Explore how to protect themselves from online threats by using security software, updating software regularly, and practicing safe browsing habits.

Art

- Exploring online safety involves expressing creativity and critical thinking skills.
- Create artwork that represents their ideas about online safety, such as posters or digital illustrations that depict safe online behaviors and warning signs of online threats.
- Explore how visual elements, such as colors, symbols, and typography, can convey messages about online safety and security.

Technology
- Understanding online safety involves concepts related to digital literacy and technology use.

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

	- Learn about different strategies for staying safe online, such as using strong passwords, enabling security features, and being cautious when sharing personal information. - Explore how to use technology tools and resources, such as antivirus software and secure browsing settings, to protect themselves from online threats. - Learn about the importance of digital citizenship and responsible online behavior.
Additional Examples and Resources	*Create classroom signs of commonly used apps/icons and links for commonly used devices that students can reference.*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Digital Literacy

Digital literacy is a multifaceted concept that extends beyond skills-based activities and incorporates both cognitive and technical skills. It refers to the ability to leverage computer technology to appropriately access digital information; to create, share, and modify artifacts, and to interact and collaborate with others. Digital literacy includes understanding the benefits and implications of using digital technologies to be successful in our contemporary world.

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Digital Literacy: Digital Use

Standard	K-1.DL.1 Identify and explore the keys on a keyboard.	
	Nouns	**Verbs**
	keys *keyboard*	*identify* *explore*
Clarifying Statement	The focus is on exploring physical and/or touchscreen keyboards, and for students to be able to identify specific keys such as arrow keys, enter, space bar, backspace.	
Focus Questions	*What is a keyboard, and what is its purpose?* *Can you identify some of the keys on a keyboard?* *What are some of the letters of the alphabet you can find on a keyboard?* *Can you find the space bar on a keyboard? What does it do?* *How do you use the enter key on a keyboard?* *What happens when you press the backspace key?* *Can you locate the arrow keys on a keyboard? What are they used for?* *What are some other keys you can find on a keyboard, besides letters and numbers?* *How do you type capital letters on a keyboard?* *What are some ways you can practice using a keyboard to type words and sentences?* *What are the differences between the physical and touchscreen keyboards?* *Can you find (a specific key) on the keyboard?*	
Academic Language	*Keyboard* *Numbers* *Keys* *Symbols* *Explore* *Shift* *Type* *Enter* *Letters* *Backspace*	
NYSED Examples	Example 1: Students can practice spelling their name and sight words. (ELA) Example 2: Students can use a keyboard to type words beginning with a letter of the alphabet for a class book or presentation. (ELA)	
Interdisciplinary Connections	***Technology*** *Understanding and exploring the keys on a keyboard is a fundamental part of technology education.* *Learn about the different functions of keys on a keyboard, such as letters, numbers, punctuation marks, and special keys like the space bar, enter key, and backspace key.*	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Explore how to use a keyboard to input text and commands into a computer or device, and practice basic typing skills.*

Language Arts

- *Exploring the keys on a keyboard involves building literacy and language skills.*
- *Learn to identify and recognize letters of the alphabet on the keyboard, as well as practice spelling and typing simple words and sentences.*
- *Explore how to use the shift key to type capital letters and punctuation marks, and practice using the space bar to separate words and phrases.*

Mathematics

- *Understanding the layout of keys on a keyboard involves concepts related to spatial reasoning and patterns.*
- *Learn about the arrangement of keys on a keyboard, such as the QWERTY layout, and practice identifying and locating specific keys using positional language (e.g., top row, bottom row, left, right).*
- *Explore how to use the arrow keys to navigate and move the cursor on the screen, and practice counting and sequencing numbers on the number pad.*

Art

- *Exploring the keys on a keyboard involves creativity and visual expression.*
- *Learn about the design and aesthetics of keyboard layouts, such as the shape, size, and color of keys.*
- *Create artwork that represents their ideas about keyboards and typing, such as drawings or collages that depict keyboards in different settings or environments.*
- *Explore how to use keyboard shortcuts and commands to create and edit digital artwork.*

Physical Education

- *Exploring the keys on a keyboard involves fine motor skills and hand-eye coordination.*
- *Practice using their fingers to press and type on the keys, and develop dexterity and control over their movements.*
- *Explore how to use touch typing techniques to type efficiently and accurately, and practice proper posture and ergonomics when using a keyboard for extended periods of time.*

Additional Examples and Resources	*Create laminated keyboards. Each keyboard would have different keys missing and students would use a dry erase to fill in the missing keys.* *Provide a visual/poster keyboard for students to reference* *Students use the keyboard to type name* *Students use the keyboard to practice spelling words*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Standard	K-1.DL.2 Communicate and work with others using digital tools.	
	Nouns	**Verbs**
	digital tools	*communicate* *work with*
Clarifying Statement	The focus should be on teaching students that people use digital tools to share ideas and work together. Communication and collaboration should be with teacher guidance.	
Focus Questions	*What are digital tools, and how do people use them to communicate?* *Can you name some examples of digital tools that people use to work together?* *How do you use digital tools to share ideas with others?* *What are some ways you can collaborate with your classmates using digital tools?* *How do you know if someone is communicating with you using a digital tool?* *What are some rules or guidelines for using digital tools to communicate and work with others?* *Can you describe a time when you worked with someone else using a digital tool?* *How do you know if a digital tool is working correctly?* *What are some ways you can use digital tools to solve problems or complete tasks with others?* *Why is it important to communicate clearly and respectfully when using digital tools to work with others?*	
Academic Language	*Computer* *Device* *Internet* *Email* *Chat*	
NYSED Examples	Example 1: Students collaboratively build a list of their favorite books, and the teacher posts the list on their class website.	
Interdisciplinary Connections	**Language Arts** - Using digital tools to communicate involves building language and literacy skills. - Learn how to express their ideas and thoughts through digital communication platforms, such as email, messaging apps, or online forums.	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- Practice writing and typing messages, as well as reading and understanding messages from others.
- Explore how to use digital tools to collaborate on writing projects or storytelling activities, where they can share ideas and work together to create a shared narrative.

Social Studies

- Communicating and collaborating with others using digital tools involves understanding social norms and etiquette.
- Learn about the importance of respectful and responsible communication online, including how to use appropriate language and tone when interacting with others.
- Explore how digital tools can connect people from different cultures and communities, and how to work together with others to solve problems and achieve common goals.

Mathematics

- Using digital tools to collaborate involves developing problem-solving and critical thinking skills.
- Students can learn how to use digital tools, such as online whiteboards or collaborative documents, to solve math problems or work on math activities with their peers.
- Practice sharing and discussing their strategies and solutions with others, as well as receiving feedback and suggestions for improvement.

Art

- Using digital tools to communicate and collaborate involves expressing creativity and visual expression.
- Explore how to use digital drawing or design tools to create artwork or visual presentations that convey their ideas and messages.
- Collaborate with others to create shared artwork or multimedia projects, where they can combine different artistic elements to create a cohesive and expressive piece.

Technology

- Using digital tools to communicate and collaborate involves developing digital literacy and technology skills.
- Learn how to use different digital communication platforms and tools, such as video conferencing software, collaborative documents, or project management apps.
- Explore how to use digital tools to share and organize information, as well as how to navigate online spaces safely and responsibly.

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

	• Learn about the importance of protecting their privacy and personal information when using digital tools to communicate and collaborate with others.
Additional Examples and Resources	*Students complete a digital questionnaire and the teachers can post results using a graph or chart to share with the class and others.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

Standard	**K-1.DL.3** Conduct a basic search based on a provided keyword.	
	Nouns	**Verbs**
	search *keyword*	*conduct*
Clarifying Statement	The teacher will provide the keyword to help students conduct basic searches using appropriate tools.	
Focus Questions	*What is a keyword, and how is it used in a search?* *How do you choose the right keyword to use when searching for information online?* *What are some different ways you can search for information on the internet?* *How do you know if the information you find in a search is reliable and trustworthy?* *Can you describe a time when you used a search engine to find information on a topic?* *What are some tips for getting better search results when using a search engine?* *How can you use keywords to narrow down your search results and find exactly what you're looking for?* *What are some examples of online resources you can use to find information on different topics?* *Why is it important to evaluate the information you find in a search and check multiple sources?* *How can you use the information you find in a search to learn more about a topic or answer a question?*	
Academic Language	*Search* *Internet* *Keyword* *Website* *Type* *Click* *Find* *Explore* *Computer* *Results*	
NYSED Examples	Example 1: Students use a teacher provided keyword to find appropriate picture(s) related to a search. Example 2: Students each create 1 page for searched images for an alphabet, or animal book. (ELA)	
Interdisciplinary Connections	**Language Arts** Conducting a basic search involves building language and literacy skills.	

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- Learn how to use keywords to search for information online, as well as how to read and understand search results.
- Practice evaluating the relevance and credibility of search results, and selecting the most appropriate sources to answer their questions or meet their needs.

Social Studies

- Conducting a basic search involves researching and gathering information on a topic of interest.
- Learn how to use digital tools to explore different perspectives and sources of information, and to deepen their understanding of historical events, cultural practices, or social issues.
- Practice analyzing and synthesizing information from multiple sources to draw conclusions and make connections.

Mathematics

- Conducting a basic search involves problem-solving and critical thinking skills.
- Learn how to formulate clear and specific search queries, and to use logical operators such as AND, OR, and NOT to refine their searches.
- Practice using numerical data and statistics to support their research findings, and to analyze trends and patterns in search results.

Science

- Conducting a basic search involves exploring and investigating scientific concepts and phenomena.
- Learn how to use digital tools to access scientific literature, research studies, and educational resources related to topics such as animals, plants, weather, or the environment.
- Practice identifying reliable sources of scientific information, and using evidence to support their hypotheses and conclusions.

Technology

- Conducting a basic search involves developing digital literacy and technology skills.
- Learn how to use different search engines and online databases to find information on the internet, as well as how to use advanced search features such as filters, date ranges, and language preferences.
- Explore how to use search tools to locate specific types of content, such as images, videos, or maps.

Art

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

	● Conducting a basic search involves expressing creativity and visual expression. ● Learn how to use digital tools to find inspiration and reference images for art projects, as well as how to explore different styles, techniques, and artistic movements online. ● Practice using search tools to discover art galleries, museums, and exhibitions in their local area or around the world.
Additional Examples and Resources	*Students can use Pebble Go search engine and compare with Google to search a topic*

Digital Literacy: Digital Use

Standard	**K-1.DL.4** Use at least one digital tool to create a digital artifact.	
	Nouns	**Verbs**
	digital tool *digital artifacts*	*use* *create*
Clarifying Statement	The focus is on students using at least one digital tool to create a digital artifact, with teacher guidance.	
Focus Questions	● *What is a digital artifact, and how is it different from a physical artifact?* ● *Can you name some examples of digital tools that you can use to create digital artifacts?* ● *How do you choose the right digital tool for the type of artifact you want to create?* ● *What are some steps you need to follow when using a digital tool to create a digital artifact?* ● *What are some ways you can express your ideas and creativity using digital tools?* ● *How do you save and share your digital artifact once you've finished creating it?* ● *Can you describe a time when you used a digital tool to create something?* ● *What are some features or functions of digital tools that can help you create a better digital artifact?* ● *How can you use feedback from others to improve your digital artifact?* ● *Why is it important to follow guidelines and rules when using digital tools to create digital artifacts?*	
Academic Language	*Technology* *Program* *App* *Art*	
NYSED Examples	Example 1: Students will begin to use digital tools to create something, like a class presentation or an About Me document. (ELA) Example 2: Students could use a digital camera and other tools to create a project about plant growth. (SCIENCE)	
Interdisciplinary Connections	***Language Arts*** ● *Students can learn how to use digital tools such as word processing software or multimedia presentation tools to compose and edit text, images, and audio.*	

- *Practice writing and typing sentences, stories, or descriptions to accompany their digital artifacts.*
- *Explore how to use digital tools to organize and structure their ideas, such as creating outlines or storyboards before they start creating their artifacts.*

Mathematics

- *Learn how to use digital drawing or design tools to create shapes, patterns, or diagrams, as well as how to resize, rotate, and arrange elements on a digital canvas.*
- *Practice using numerical values and units of measurement to adjust the size, scale, and proportions of their digital artifacts, such as resizing images or adjusting font sizes.*

Science

- *Learn how to use digital tools such as simulation software or data visualization tools to model and simulate scientific experiments or observations.*
- *Practice collecting and analyzing data from digital sources, such as online databases or sensor networks, and using this data to create visualizations or presentations that communicate their findings.*

Social Studies

- *Research and present information on historical events, cultural practices, or social issues using digital tools.*
- *Learn how to use digital tools such as online databases, digital archives, or mapping software to access and analyze primary and secondary sources of information.*
- *Practice organizing and synthesizing information from multiple sources to create digital presentations, reports, or timelines that convey their understanding of historical and social phenomena.*

Art

- *Expressing creativity and visual expression using digital tools.*
- *Learn how to use digital drawing or painting software to create digital artwork, as well as how to experiment with different brushes, colors, and textures to achieve desired effects.*
- *Explore how to use digital tools to edit and manipulate photographs or images, such as cropping, retouching, or adding filters, to create visually appealing compositions.*
- *Practice using digital tools to create animations, videos, or multimedia presentations that combine different artistic elements.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

NYS Learning Technology Grant 2021-2024   Dryden/Groton Consortium

	Technology ● *Learn how to use different software applications, online platforms, or digital devices to create, edit, and share digital content.* ● *Explore how to use digital tools to collaborate with others on projects, such as sharing files, giving feedback, or working together in real-time on shared documents or presentations.* ● *Learn about digital citizenship and responsible use of technology, such as respecting copyright and intellectual property rights when creating and sharing digital artifacts.*
Additional Examples and Resources	*Students use device to create a slideshow to retell a story* *Students create a collage using digital images*

Impacts of Computing

Computational Thinking

Networks and Systems Design

Cybersecurity

Digital Literacy

Digital Literacy: Digital Use

Standard	K-1.DL.5 *This Standard begins in Grade Band 4-6.	
	Nouns	**Verbs**
Clarifying Statement		
Focus Questions		
Academic Language		
NYSED Examples		
Additional Examples and Resources		
Interdisciplinary Connections		

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Digital Literacy

Digital Literacy: Digital Citizenship

Standard	K-1.DL.6 *This Standard begins in Grade Band 2-3.	
	Nouns	**Verbs**
Clarifying Statement		
Focus Questions		
Academic Language		
NYSED Examples		
Additional Examples and Resources		
Interdisciplinary Connections		

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Digital Literacy: Digital Citizenship

Standard	**K-1.DL.7** Identify actions that promote good digital citizenship, and those that do not.	
	Nouns	**Verbs**
	digital citizenship *actions*	*identify* *promote*
Clarifying Statement	Students are able to identify the basic concept of being a "good digital citizen", and know what actions are and are not safe, responsible and ethical when using technologies.	
Focus Questions	*How can you be kind to others when using technology?* *What should you do if you see something online that seems untrue?* *Why is it important to follow rules when using technology?* *How does using technology affect the way people interact with each other?* *What can you do to keep yourself safe when using technology?* *Why is it important to ask an adult for help if you're unsure about something online?* *How can you use technology to share positive messages with others?* *What are some things you shouldn't do online, even if it seems fun?* *How can you use technology to learn new things and explore the world?* *Why is it important to respect other people's privacy and personal information online?*	
Academic Language	*Safe* *Respect* *Kindness* *Sharing* *Privacy*	
NYSED Examples	Example 1: Students hold up red light/green light signs at teacher prompts about actions with technology/in online environments, such as "Share your password," "Go to sites linked from our class webpage," "Write something mean about someone," etc. Actions could be added to a running list on a chart displayed in the classroom. Example 2: Students as a class can compare appropriate/ inappropriate online behavior to appropriate/ inappropriate in-person behaviors. Example 3: Students could identify why they should find and use truthful information online.	
Interdisciplinary Connections	***Language Arts***	

Impacts of Computing   Computational Thinking   Networks and Systems Design   Cybersecurity   Digital Literacy

- *Learn how to communicate effectively and respectfully online, including using appropriate language and tone when interacting with others in digital environments.*
- *Explore how to interpret and evaluate digital media and information critically, including identifying bias, misinformation, and fake news.*
- *Practice writing and sharing digital messages, such as emails or social media posts, that promote positive online behavior and values.*

Social Studies

- *Understanding social norms, values, and ethics in digital environments. Students can learn about the rights and responsibilities of digital citizens, including privacy rights, copyright laws, and ethical guidelines for online behavior.*
- *Explore how digital technologies impact social relationships, communities, and societies, and how to navigate digital spaces safely, respectfully, and responsibly.*
- *Learn about the history and evolution of digital technologies, including the internet and social media, and their impact on culture, politics, and global connections.*

Mathematics

- *Developing problem-solving and critical thinking skills.*
- *Learn how to analyze and evaluate digital risks and opportunities, including identifying online threats such as cyberbullying, phishing scams, and identity theft.*
- *Explore strategies for managing digital resources and information effectively, such as organizing files and passwords, and using encryption and security software to protect personal data.*
- *Practice using mathematical concepts and tools to measure and quantify digital behaviors and outcomes, such as tracking screen time or analyzing online interactions.*

Science

- *Understanding scientific principles and concepts related to digital technologies and information systems.*
- *Learn about the technology behind digital devices and networks, including hardware components, software applications, and internet protocols.*
- *Explore how digital technologies impact human behavior and society, including cognitive development, social interaction, and mental health.*

Impacts of Computing   **Computational Thinking**   **Networks and Systems Design**   **Cybersecurity**   **Digital Literacy**

- *Learn about the scientific method and how to apply it to digital research and experimentation, such as testing hypotheses about online safety or conducting surveys about digital habits and attitudes.*

Art

- *Expressing creativity and visual expression.*
- *Learn how to use digital tools and media to create digital artworks and messages that promote positive online behavior and values.*
- *Explore how to use digital storytelling techniques to convey complex ideas and emotions in digital formats, such as videos, animations, or interactive presentations.*
- *Learn about digital aesthetics and design principles, including color theory, typography, and layout, and how to apply them to digital content creation.*

Technology

- *Students can learn how to use digital tools and platforms safely, responsibly, and ethically, including understanding and respecting digital rights and responsibilities.*
- *Explore how to use technology tools and resources effectively to manage digital identities, relationships, and reputations, including privacy settings, security features, and digital footprints.*
- *Learn about emerging digital technologies and trends, such as artificial intelligence, virtual reality, and blockchain, and their potential impact on digital citizenship and society.*

Additional Examples and Resources	*Create a T-chart, students identify actions/behaviors that are examples a good and inappropriate online behavior*

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Cybersecurity

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